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DIFFUSE GLIOMA OF THE PIA MATER.*

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In rare instances it has been observed that the leptomeninges of the central nervous system may be diffusely invaded by glia cells. In all such there has been present a gliomatous tumor of the substance of the brain or more frequently of the spinal cord. The infrequency of such tumors of the membranes and the diverging views which are held as to the mode of spread of diffuse tumors of the pia mater makes their report a matter of special interest.

It has recently been possible for us to study the distribution and mode of spread of such a tumor which showed an unusually wide-spread distribution in the membranes of the central nervous system and in a very unusual way formed metastases within the substance of the brain at a remote distance from the primary tumor.

The material came from a patient who had been under treatment in the Traverse City State Hospital, and was from a man who had died there at the age of 40. His condition does not seem to have attracted attention until March, 1910, when various mental abnormalities developed which brought about his commitment to the State Hospital for the Insane in the following June. He then showed little interest in his environment or his personal care. His mood at times was depressed and he expressed delusions of suspicion and persecution. He was physically weak and extremely apprehensive. Sleep was only obtained with heavy doses of sedatives. He soon became unable to comprehend questions and was

* This paper forms contribution number eight of the Worcester State Hospital (Mass.), Series of 1912, offered in compliment to Dr. Hosea Mason Quinby on the event of his retirement from the Superintendency after 20 years of service.

completely disoriented. At times he twitched and jerked. The heart's action was weak and irregular. He continued restless until his death about four months after the onset of the clinical symptoms.

The examination of the brain was made after several weeks' preservation in 10 per cent formaline. The dura mater showed no gross pathological changes. The pia mater of the entire brain showed varying degrees of opacity and thickening. This was most marked at the base of the brain, especially below the cisterna interpeduncularis, the pons and the inferior surface of the cerebellum.

Over the convexity the pia was turbid and thickened above the lower part of the fissure of Sylvius and somewhat less so over the frontal, central and first temporal convolutions. The pia over the occipital regions was clear except for narrow gray streaks which bordered the vessels passing over the sulci.

Where most marked the changes gave the pia a gelatinous appearance, and in places the underlying brain substance was completely obscured. In some respects the gross appearance suggested a purulent exudate.

Longitudinal sections through the brain showed that the pia over the lateral occipital margin was not perceptibly thickened but elsewhere along the margin of the hemispheres the thickness varied considerably. Along the mesial margin of the frontal lobes the thickness was from 1-2 mm. and in places over the Island of Reil exceeded 3 mm. The thickening was especially marked in the tela choroidea of the third ventricle.

The vascular trunks at the base were unchanged excepting for a small patch of sclerosis in the basilar artery. The olfactory bulbs were much obscured by the thickened pia and in varying degrees this thickening was present around the portions of the cranial nerves which were still attached to the brain.

The pons was encircled by a sheath of pia at least 2 mm. in thickness. The hemisphere showed slight bulging of the convolutions of the right occipito-temporal region.

In the white substance of the right occipito-temporal region lay a large tumor mass. In a plane passing through the middle depth of the thalami the surface area of the tumor measured 4 cm. in antero-posterior diameter and 3.8 in transverse diameter. Its anterior border was 1 cm. posterior to the calcarine fissure. The

cavity of the posterior horn of the right lateral ventricle was completely obliterated by the mass. (Fig. 1.)

The color of the cut surface of the tumor in its hardened condition was grayish, with a pinkish hue in portions. Its structure was rather loose and granular in its outer part and more compact in its inner two-thirds. Excepting for a small firm portion near the corpus callosum, its consistency was soft. Its limitations from the surrounding brain substance were not sharply defined. The ependyma of the anterior and posterior horns of the lateral ventricles was finely granular.

A cross-section through the pons in the plane of the posterior corpora quadrigemina showed the pia greatly thickened and a small wedge-shaped focus of softened brain substance, yellowish red in color, which lay within the substance of the right quadrigeminal body. This had a depth of about 7 mm. and a width of 4 mm.

The spinal cord was not available for study, but the pia of the upper few centimeters that were attached to the brain was thickened and opaque.

Microscopic examination of the tumor in the right occipitotemporal region showed it to be a glioma. Its structure was not uniform, for in certain parts fibers predominated, in others the tissue was oedematous and in some places necrotic.

Its margin towards the brain substance was not sharply circumscribed. Glia cells and fibers lay close against nervous tissue, healthy in appearance, excepting for scattered glia cells which had pushed in along the vessels or coarser glia septa. Between the tumor and the brain substance there was no connective tissue or zone of softening.

The specific cells of the tumor showed a considerable variety of forms but all had the characteristics of glia cells. These were largely oval or polygonal in outline and where fibers were most numerous spindle-shaped cells predominated. They varied much in size, some exceeded 85 micra. in diameter. Cells with several nuclei, sometimes as many as seven, were not uncommon. A few showed mitoses. Many cells which had undergone degenerative changes lay scattered through the looser parts of the tumor. Such cells were usually of larger size, often they were highly vacuolated and showed peculiarities in staining qualities.

All through the area of the section were fibers which showed the staining qualities of glia fibers by differential methods. They were most numerous in the more compact parts of the tumor, adjacent to the brain substance.

The tumor was in close proximity to the ventricle ependyma, and in places had broken through and grew free in the ventricle cavity. Where the line of cells was broken through, cells which showed the characteristics of ependymal cells lay scattered among the tumor cells.

In one place there was a continuous ring of ependymal cells, enclosing a cavity containing a finely granular material. This lay near the line of ependymal cells which marked the wall of the ventricle but was entirely cut off from it by the cells and fibers of the tumor.

The tumor was highly vascular. Many of the vessels had numerous glia cells in the spaces of the adventitia, and the same type of cells were more or less numerous in the walls of vessels which passed through the brain substance well outside of the margin of the tumor. In the less compact portion of the tumor were wide spaces, formed from a coarse stroma of connective tissue containing many vessels which lay singly or in clusters. There seemed to be a marked hyperplasia of the perivascular connective tissue. It could not be accurately determined whether this portion was a vascular structure which had become invaded by the tumor or vessels which had proliferated in the tumor itself. This particular region included the ventricular portion of the tumor and it may have included part of the choroid plexus at the meeting point of the posterior and inferior horns. Glia cells were more loosely scattered in among these wide spaces and degenerated forms were common. A large vein which passed through the subependymal region showed dense infiltration of its adventitia with cells which corresponded in characteristics to those of the tumor. (Fig. 2.)

Parts of the tumor showed degenerative changes. These were smaller and larger areas in the less compact portions of the tumor, in which the cells were loosely crowded together, the nuclei stained poorly, and the bodies of the cells were coarsely granular. In other parts of the tumor there were small cysts with finely granular contents and areas in which there was much fibrin.

In the looser parts of the tumor were patches in which glia fibers were densely massed. Among these were glia cells resembling more those normally seen in the subependymal regions, and showed fewer of the forms with large bodies, which elsewhere in the tumor were so numerous.

The chief interest in this case centers around the changes in the pia mater. Histologic studies were made from the cortex and its overlying pia in a variety of regions, which showed differences in the extent of the infiltration. All regions of the hemispheres showed some pial infiltration. The minimal amount of this was over the superior surface of both first frontal convolutions, and the maximal was in the pia of the first part of the Sylvian fissure, the layer of pia lying between the cerebellum and pons, and that over the inferior surface of the cerebellum. In some places the pia measured 3 mm. in thickness. (Fig. 3.) Over the hemispheres it was largest in amount near large blood vessels and over sulci. It usually followed the pia to the depth of the sulcus. Where the infiltration was not too dense it was observed that it diminished in amount, thinning out over the convolutions away from the sulcal blood vessels. Extensions of the infiltration followed the blood vessels into the cortex and where the pia had pulled away from the cortex, conical tufts of adherent cells remained connected with the pia.

The infiltrating cells lay in the pia and where large in amounts, in the subarachnoid space. The infiltration was most dense in the deeper layer of the pia. Only when the amount was unusually large did the arachnoid itself appear to be infiltrated. In most places the arachnoid showed no infiltrating cells although the pia underlying contained a considerable amount. The infiltration was composed chiefly of two types of cells. The most numerous were identical in form and other characteristics with cells which made up the greater part of the tumor in the brain substance. The other type were small round forms, either like nuclei with little or no bordering cytoplasm and closely resembled lymphocytes in their general appearances. These forms were most numerous where the amount of infiltration was least. Whether or not they were glia cells or lymphocytes which originated from the chronic irritative process that was present in the membranes was not determined. These cells were not unlike certain types of glia cells met with in gliomata of embryonal origin.

The most abundant type were without doubt glia cells, in spite of a large variation in form and size. Where most tightly compressed, as where the infiltrating elements appeared to be pushing out into uninvaded regions of pia, they were largely spindle-shaped. Elsewhere they were oval, rounded, or polygonal forms with a cell body composed of a relatively large amount of finely granular cytoplasm, and one or two nuclei placed near one edge of the cell. A few cells, usually of large size, had in their cytoplasm small clear spaces not unlike vacuoles. The glia cells lay closely packed together, often intermingled with shreds of tissue which gave the reactions of connective tissue, evidently from torn septa of the pia mater. No glia fibers were demonstrable. The marginal glia of the underlying cortex was greatly increased in amount and large progressive types of glia cells were conspicuous through the upper strata of the cortex.

It was not uncommon to find epithelioid cells scattered in few numbers among the other cells; usually these were near large blood vessels. In a few places, where the infiltration was large in amount, as between the cerebellum and pons there were epithelioid cells with pigment inclusions, marking the location of old hæmorrhages.

There were found a few small areas in the pial infiltration in which the cells stained less strongly. The area was more loosely formed and had the appearance of necrotic changes.

The walls of the blood vessels of the pia mater showed varying degrees of invasion by tumor cells. It was common, where there was any considerable amount of infiltration of the pia, to find glia cells lying among the fibers of the adventitia of arteries, usually in the outer part and never reaching the media. Where there was little infiltration of the pia the walls of the vessels were free from invading cells. Some large arteries such as branches of the Sylvian artery, even where they were surrounded by dense infiltration, showed no cells in the adventitia, possibly due to the greater compactness of the outer coat of the vessel.

The walls of the veins were much more invaded than the arteries. In many instances glia cells had spread among the fibers almost to the endothelial lining of the vessel. In some instances it was very difficult to demonstrate any wall of a vein, the blood lying almost as if in a sinus passing among the infiltrated pial spaces.

The infiltrating cells followed the blood vessels into the brain substance. In almost any region where there was any considerable amount of infiltration of the pia the blood vessels in the upper strata of the cortex showed varying numbers of glia cells in their walls. In cross-sections they formed concentric layers of cells outside of the elastica, considerably widening the vessel area. The amount of the infiltration was relatively proportional to the number of cells present in the overlying pia mater.

When the pia was separated from the cortex, short plugs or tufts of cells projected from the inner surface of the pia, showing where vessels and infiltration had been pulled out from the brain substance.

The tumor cells all lay among the adventitial fibers, or in the Virchow-Robin lymph space. In a number of instances the cells had broken out from the adventitia, and lay around the vessel, but there was no evidence to show that they were lying in a pre-formed space.

In one place the relation of this infiltration to the adventitia was well shown in a vessel in which the fibers of the adventitia had been almost completely pulled away from the media by an unusual amount of infiltration. A circular outline of the structure was preserved, but the remaining part of the vessel was pushed to the outside of the area. (Fig. 4.)

In the pons there was found a similar condition but the cells had broken through the wall and had spread out among the surrounding nervous elements and formed a new focus of tumor growth. (Fig. 5.)

In two places there was a direct invasion of the nervous substance by the cells of the pial infiltration. In one of these there was a very dense infiltration of the pia of the cerebellum and from this, rows of cells pushed in a broad area down to the granule layer. In this region there was an hæmorrhagic extravasation, and numerous blood cells and epithelioid cells with inclusions of hæmatogenous pigments, mingled with tumor cells in the cerebellar tissue.

The other instance of direct invasion was in the cerebello-pontine region where the dense infiltration of the pia was continuous with a broad area in which tumor cells had spread through the pontine substance.

The ependyma lining the ventricles showed in a few places ependymal granulations but no deposits of cells of the type of those found in the pia or tumor.

Sections across the optic and motor oculi nerves showed them to be ensheathed in a layer of cells similar to those found elsewhere in the pia.

The foregoing description is that of a large glioma, growing in the subependymal substance in the right occipito-temporal lobe, which has invaded the adjacent pia mater and spread widely through the pia of the greater part of the brain, cerebellum, cranial nerves, pons, medulla and at least the upper part of the spinal cord. In its extension it has pushed in among the fibers of the pia mater and in places lies in the subarachnoid space. From the spaces of the pia glia cells have invaded the lymph spaces of the adventitia of the blood vessels and extended deeply into the substance of the brain and in places these have broken through the vessel walls and formed focal metastases in the perivascular area.

The frequency with which such tumors occur is not great. Of some 87 diffuse tumors of the pia mater of the brain and cord, which were accessible to us in the literature, 18 were composed wholly or in part of glia elements. (Literature references 1-18.) Of these 11 cases (cases 1-11) were described as gliomata and 7 cases (cases 12-18) as glia-sarcomata.

In 11 instances (cases 1-5 and 13-18) the process was localized in the pia of the brain and in 7 instances (cases 6-12) the cord alone was involved. When the pia mater of the brain was involved there was always present a primary tumor of the brain substance.

The close proximity of most of these tumors to the ventricles of the brain has made the matter of their mode of spread rather uncertain. It has been suggested by some, notably Barnes (19) in the case of diffuse sarcoma of the pia that the cells from the primary tumor are wafted by the lymph through the spaces of the pia mater. By others it has been found that the primary tumor directly invades the pia and from this place starts its spread through the membrane.

Our own case has nothing to bear out the theory of spreading by way of the ventricle fluid. Nowhere are there accumulations of glia cells in the ependyma of the ventricles and the evidence of spreading by way of the direct invasion of the pia is abundantly shown. The tumor cells lie among the fibers of the pia and only

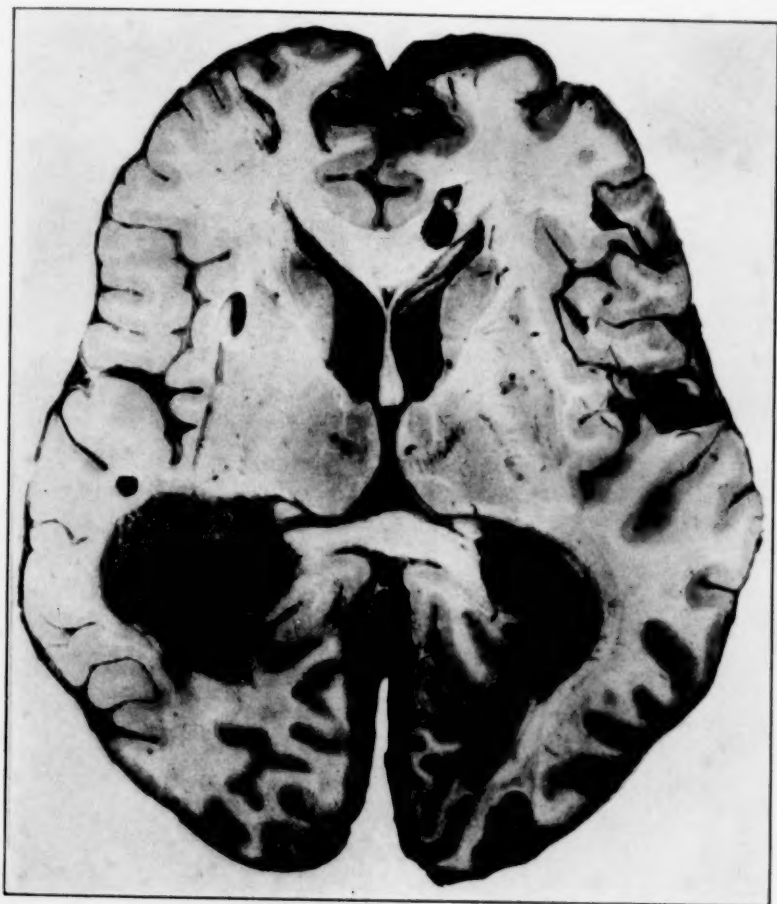


FIG. 1.—Tumor of temporo-occipital lobe with thickened pia mater.



FIG. 2.—Vein in the tumor with walls infiltrated by glia cells. Mag. 60.



FIG. 3.—Pia of Sylvian Fissure, with infiltration of glia cells. Mag. 74.

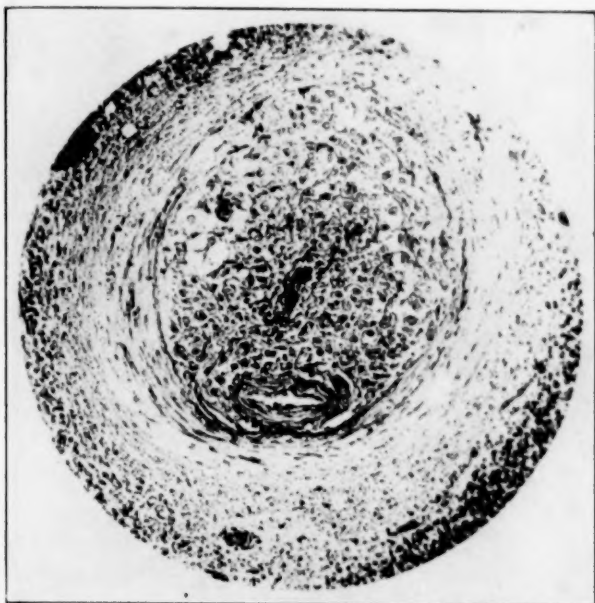


FIG. 4.—Artery with distension of adventitia by glia cells.
Mag. 100.

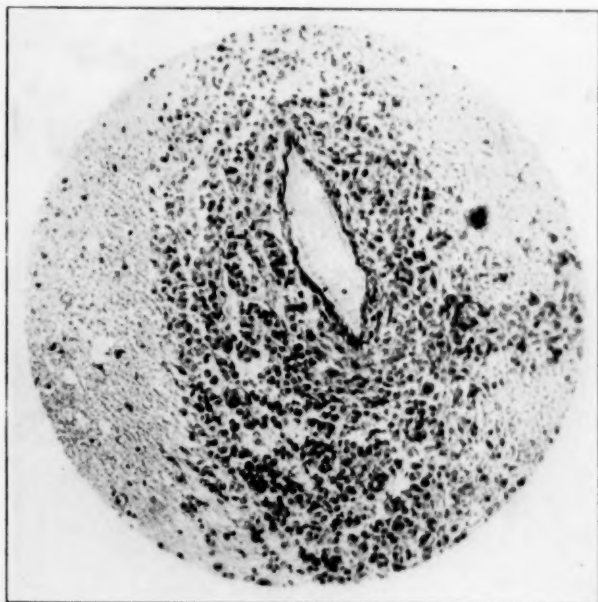


FIG. 5.—Invasion of a perivascular area by cells from
adventitial infiltration. Mag. 100.

locally, where there are large accumulations of cells, does the tumor extend out from the deeper layers of the pia. There were a number of places where there was such a limited amount of infiltration that this path of extension was well shown. In these regions the cells could be seen spreading out from larger accumulations near the blood vessels among the fibers of the lower strata of the pia into uninvolved portions of the membrane, and lying entirely within the pia.

The dissemination of the tumor elements is in large part through the lymph spaces among the adventitial fibers of the vessels. They enter these by way of the pia and often produce great distensions of the outer parts of the vessel wall. Such conditions lead to bursting of the walls and, in the instance of the breaking out of the infiltration of the adventitia in the vessel of the pontine substance and the formation of a new tumor, we have an exception to the statement of Bruns (20), that gliomata are solitary tumors and do not form metastases at a distance from the primary tumor. Further there are direct invasions of the brain substance from the infiltration of the pia, where glia cells break through the marginal glia and pass into the cortex. That this was best marked in the cerebellum may be due to the poor development of a marginal glia layer in this place.

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NEW FORMATION OF NERVE CELLS IN AN ISOLATED
PART OF NERVOUS PORTION OF THE HYPOPHY-
SIS-TUMOR IN A CASE OF ACROMEGALY WITH
DIABETES, WITH DISCUSSION OF THE HYPO-
PHYSIS-TUMORS FOUND SO FAR.*

By ADOLF MEYER.

After the publication of the exhaustive articles of Hinsdale and of Brooks on acromegalia it would seem rather superfluous to undertake a new summing up of the data concerning this disease. There is indeed only one point to which the writer would invite the attention of the reader, a point which has been dealt with in such an inharmonious manner by most writers that it is worth a careful investigation, although more than one author has foreshadowed the results at which we shall arrive. It is the question: What is the nature of the transformation which the hypophysis undergoes in acromegaly?

The case is one of typical *acromegaly in a woman of 52, of six years duration, associated with paranoic condition, and adenoma-like tumor of the hypophysis of a hyperplastic-progressive character*. The history is given by the patient.

The family history is negative. The patient was born in Ireland, 1847, and lived at home until 1865, when, 18 years old, she came to the United States with a number of others who had volunteered as missionaries. She went to Philadelphia because a friend of hers had a brother who was "cardinal of Pennsylvania." She went to a convent in Pennsylvania and taught there one and one-half years, but left to learn the millinery trade in Philadelphia. After one and one-half years she went to Boston, was bookkeeper and cashier for a year and a half, and then milliner for 16 years with some interruptions. At 32 (1879) she married, but lived with her husband only one year "because he was not worthy of her society." She opened a candy store and two years later a millinery store, and finally for the last eight years, she canvassed corsets.

Her health was good. She menstruated at 14 and reached the menopause about 1894.

Her troubles began about 1882 when she was 35 years old. The dates are somewhat indefinite and cannot be controlled because the patient has

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no near friends. She saw a policeman L. McC. in a compromising position with his servant on the steps and was "imprudent enough to speak about it to his mother-in-law." He has been her enemy ever since. When she moved to Clarendon Street, shortly afterwards, he came and gave his name as Mr. Miller, hired a suite of rooms paying \$50 a month. The first sign of his enmity was that when she was doing something at the window, he called, "Mrs. C—," and then dodged and afterwards she saw him with a broom and dustpan, saying, "I will sweep you out of doors," at the same time making brushing movements. About nine years ago a Mrs. P— and her son who was a theological student began to rob her. He came and took things from her store by piece-meal and carried them to his father's. She then was away from the store about a week waiting on a friend and, when she returned, found everything moved out and her trunk opened and \$275 in money and a number of souvenirs taken. Mrs. P— then bribed the police to keep the secret. For the last six years, she has been pursued by a woman whom she upbraided for leading an immoral life and for encouraging her daughter to do the same. The detective McC. and this woman L. persecuted her ever since then and *5 or 6 years ago the worry and the thought of these persecutions made her mouth and eyes what they are and twisted her face out of shape.* While she was peddling corsets a Jew often followed her and she saw how, on one occasion, by some signs, he influenced a woman when she came to the door, not to take the corsets after she had engaged them. Finally he took a room in the same house where she was boarding just before her commitment. Three years ago her pet dog was killed because of spite on the part of the woman with whom she boarded.

The physicians' certificate and a few letters from a hospital state that for some time the patient, a person of some education and refinement, has been drifting about without financial means and lodging where any one would keep her. From November 20, to December 24, 1898, she was treated in St. Elizabeth's hospital for diabetes mellitus. There she acted strangely at times, using very saucy and disrespectful language to both nurses and physicians. She would write poetry, draw, crochet, and sit at the window talking to the birds by turns. She declared that all the birds knew her and would come to her when she called them by name. She was very quick-tempered and when she was in a rage there was nothing too bad for her to say. She left unimproved.

February 16, 1899, she set her room on fire, probably by accident, and was taken by the police to the House of Detention. There she told the physicians, "a gang was instituted to harm me, a conspiracy to drive me from place to place. They steal from my bureau; a man in the house opposite has watched me for two years. Two policemen in priest's clothes came and took me yesterday." She was then committed to this hospital.

The following physical examination was made by Dr. Noble:

Weight, 115 lbs. Height, 4 feet 11 inches.

Hair originally brown, now quite gray. Eyes brown. Complexion light. Only fairly nourished. Muscles small and flabby.

Vaccination scar on right arm. From smallpox in infancy a few pits seen on the anterior side of the trunk remain. Small cyst of the size of a pea at the outer canthus of the right eye. Slight abrasion over middle of left shin. Beside it a small mole of the size of a pea. A small mole, also size of pea, near the spine between the scapulæ. A transverse scar in left lumbar region, 4 cm. in length.

Tongue broad and thick. Patient believes it to be swollen in last two years.

Head and features symmetrical. The latter broad and coarse. Thick everted lower lip; face sparsely covered with coarse hair. Ears small; lobules attached. Palate about medium height and width. The teeth were few and decayed, with intervals between them. Patient says the features have become much coarser than formerly. Some puffiness of lids of both eyes. *Hands* and fingers have become club-shaped; the same condition of *feet*. Double hallux valgus. Second toe over-riding the first.

Measurements.—Distance from chin to nose 73 mm.

From the chin to between the orbital ridges 130 mm.

From the latter point to the bregma 120 mm.

From bregma to the occipital protuberance 29.5 cm.

Circumference of head (just above superciliary ridge and over occipital protuberance) 54 cm.

Length of each ear 6 cm.

Angle of jaw to chin on either side 12 cm.

Distance from right styloid of the olecranon to the tip of middle finger 17 cm.; left 17½ cm.

Right wrist 15 cm.; left wrist 15 cm.

Metacarpal bones, including thumb, 19 cm. on right hand; left practically the same (it may be a trifle less).

Circumference of right knuckles 19.5 cm.; left 18.5 cm.

Circumference of right thumb, 1st joint, 7 cm.; left the same.

Circumference of right index, middle joint, 7 cm.; left the same.

Circumference of neck 23 cm. (little if any evidence of thyroid).

Length of right foot 21.5 cm.; left the same.

Over ball of large toe right 24.5 cm.; left 22.5 cm.

Circumference over instep of right 22.5 cm.; left 21.5 cm.

Circumference of heel and instep right 31 cm.; left the same.

Circumference of middle of great toe right 8.5 cm.; left the same.

Circumference of right leg just above ankle 18 cm.; left the same.

Circumference of middle of right leg 26 cm.; left the same.

Circumference over right patella 30 cm.; left the same.

Circumference of right thigh 35.5 cm.; left 35 cm.

Circumference of middle of right arm 16 cm.; left 18 cm.

Circumference over right olecranon 20 cm.; left 19.5 cm.

Circumference of right upper arm 19 cm.; left 20.5 cm.

Circumference of trunk over umbilicus 87 cm.

General Sensations.—Feeling of exhaustion. Pain encircling the sides of the head, severe pains in the knees, confined to the joints, also in the

hands. Occasional pains across the small of back. No soreness along the course of large nerve trunks. Patient complains of pain in the bones, away from the joint.

Eyes.—Movements normal. Pupils react directly and consensually. Vision very poor. Always wore glasses. Visited out-patients' department, City Hospital, in about 1890 on account of an injury of left eye, at which time she had "muscae volitantes." The field of vision is greatly restricted, concentrically, on both eyes.

Hearing.—Watch heard at distance of one inch from either side. No history of otitis media.

Smell.—Patient distinguishes and names odors (patient says better on right than left).

Taste.—Normal.

Cutaneous Sensibilities.—Touch, pain and temperature normal.

Reflexes.—Of elbows, wrists, knees diminished, more reaction in the left knee than right. Plantars exaggerated slightly.

Motor Functions.—Of face normal. Tongue protrudes in median line. Coordination of hands good. Gait weak and unsteady. No Romberg symptom. General muscular weakness. No tremor of tongue or hands.

Sleep poor in the last fortnight. Appetite good. Tongue clean but dry and red and large. Teeth poor. Bowels with tendency to constipation. Intense *thirst* since 1897. Water passed frequently and in large quantities, but less now than a month and a half ago. Some pruritus vulvæ in last two months. Abdomen distended, somewhat tympanitic. Liver dullness from sixth rib to costal margin. Moderate kyphosis of the dorsal region.

Lungs.—Negative. Patient says her *voice* has become coarse and gruff in the last three years.

Heart.—Outlines of dullness: Right border of sternum, 3d interspace, one cm. outside the nipple line. Apex beat one cm. outside nipple line. Systolic murmur loudest at apex, transmitted toward the axilla. Aortic first sound roughened. Pulmonic second accentuated. Palpitation at times. Pulse 90 lying; 96 sitting. Rigidity of radials and temporals.

Menopause.—Established four years ago.

Urine.—February 20. Pale straw color, clear, acid, 1034, heavy with *glucose*, no albumen. Few blood corpuscles, epithelium from bladder, leukocytes.

July 19-20, 11½ pints of urine in 24 hours.

Urine.—July 21. Pale straw colored, with some cloudiness all through specimen, 1028, acid, no albumen, large quantity of sugar. Quite a number of single and stratified pavement epithelia.

Summary: The face, tongue, hands and feet show the typical alterations of acromegaly, which have developed during the last six years, from the age of 46. There is further marked constriction of the visual field, with "mouches volantes" on the left, a gruff, nasal voice, and diabetes mellitus (intense thirst since 1897) with pruritus vulvæ; no complete disappearance of sugar when dieting; diminution of the right knee jerk; mitral insufficiency and rigidity of radials and temporals, general exhaustion.

During the residence at the hospital, from February 17, 1899, to her death on August 14, 1899, the patient presented a rather uniform picture. She was somewhat restless and complained much of headache or of being neglected. She would usually lie on her bed, rather carelessly dressed, or rarely sit in a chair, with a pitcher of water on a table near her. She shows in her manner of speech a certain element of refinement which however gives way very easily in her behavior with the attendants and even at times in her fault-finding with everything around her. She is apt to use very endearing expressions to the physicians and occasionally to a patient, and when speaking of her former appearance, her tiny features and graceful hands and feet, her beautiful work, her excellent memory and her superiority over all those with whom she lived and was now put; and in her statements of her own family she indulges in rather glowing colors. In the account of her earlier persecutions she is very profuse and frequently produces new facts. The history in the anamnesis is put together of such facts; they are poorly correlated more or less independent grievances and not systematized in detail beyond the general principle of persecution and the alliance of Mrs. L— with the detective (who denies in a letter all knowledge of the patient). Her circumstantiality rivals with the clever choice of expressions. Her complaints referred partly to feebleness or headaches (through the parietal regions) and pains in her wrists and knees; occasionally to lack of sleep, but especially to the treatment and neglect by the attendants, the food, etc. She knows as much as President McKinley and is like a pure baby among these patients and everybody, especially the attendants, too mean and low to wait on her, immoral, unfit to approach her to take her temperature. She often invents falsehoods (the attendant had been wearing her skirt on her wheel and has stretched her jacket in trying to get it around her; she knows a strange woman in disguise"), is apt to become obscene and to talk to visitors in this tone. A lame pigeon which happened to stay in her room a few days and flew away was "killed by the attendants." July 3 the attendants "put a rat in her room to kill her." She did not like to be examined and was difficult to hold to accuracy as she talked continually of other matters. Her weight varied between 119 and 126. At times she was troubled with flatulence. Even under careful dieting the sugar did not disappear completely from the urine.

August 11 she began to vomit and to have diarrhoea, she grew weaker and unconscious on August 13, with short conscious intervals during the afternoon; she was so weak that she could not raise the head in vomiting. She died in a coma, August 14, 1899.

Report of the *autopsy*.—Death at 11.40 a. m., post-mortem examination at 1.30 p. m., August 14, 1899

Short female body with beginning rigor mortis. Lividities of dependent parts.

Panniculus adiposus about 1 cm. in thickness, light colored. Muscles rather thin, fairly dark colored. Clavicle, sternum and the cartilaginous part of ribs prominent. The right and left first, and the right and left

second, and the right third and fourth cartilaginous junctures prominent, passing abruptly into the rib.

Stomach reaching the umbilical line. Liver extending 10 cm. below ensiform process and reaching the costal margin in a transverse line, 4 cm. above the umbilicus.

Omentum with moderate amount of fat. Intestines grayish, little injected. No fluid in the abdominal cavity. Bladder fairly filled. Uterus in normal position, thin, with two fibroids, one cherry-sized in posterior wall, and one pea-sized in the sub-peritoneal space. Ovaries small. In the broad ligament on either side there is a thin strand, feeling like arteriosclerotic blood-vessels.

The diaphragm at the fifth rib on the left and the sixth interspace on the right. Both eighth ribs have a free anterior termination about 9 cm. from ensiform process. Both ninth ribs extend to 13 cm. from ensiform process. No thymus present.

Left lung slightly adherent at apex; right lung with one firm strand passing from the upper lobe to the chest wall, which is also slightly adherent at the apex.

Heart 380 gm. Very little fluid in the pericardium. Large milk spot over right ventricle, and various white streaks over apex. Heart large with contracted left ventricle. Prominent veins and distinctly nodular, prominent, coronary vessels, head-like in their whole extent, and tortuous. A large mixed clot in the right auricle and ventricle extending into the pulmonary. The tricuspid with thin valves. Peculiar vesicular elevations of endocardium, resembling fresh herpes vesicles. On the posterior aspect of the auricle and ventricles there are diffuse ecchymoses and also scattered ones, similar, but few near the apex and along the posterior left ridges; and a gray spot of the muscle of the left ventricle just 1 cm. from the apex on the posterior side measuring 5 x 11 mm. Intima of right ventricle free. Intima of pulmonary with a number of yellow patches. Left auricle with numerous ecchymoses only on outer surface, none beneath intima. The mitral ring has a number of calcareous spicules; the valve is open only to one finger. The mitral ring when opened measures 9 cm. The valves are short and considerably thickened along the margins, but without fresh vegetations. The largest calcareous deposits are situated at the attachment of the posterior mitral, there being a whole nest of calcareous deposits. The cross-section of the muscle of the left ventricle is 21 mm. and 11 mm. in the posterior wall where the muscle is mottled, especially towards the apex where the gray spot is noticed. The mitral shows diffuse yellow spots, also the aorta very slight diffuse ones, becoming more numerous near the aortic ring. The ecchymoses at the base of the ventricles are not accounted for except by the presence of very extensive calcareous degeneration of vessels, and a few clots which do not resemble well defined thrombi, but rather fragmentary coagula, especially in the very atheromatous posterior artery of the left ventricle.

Left lung, 395 gm. Bluish discolored only in the posterior part of the

lower lobe. Frothy fluid coming from the chief bronchus. No foci of induration, but diffuse moderate œdema. Bronchi somewhat hyperæmic.

Right lung, 460 gm. Two scars in the apex without induration. Very slight lividity of the lower lobe. Bronchus also with dark colored mucus, slaty (similar to stomach contents), moderate œdema.

Pancreas of normal consistence and appearance.

Spleen, 215 gm., with very calcareous artery, rather large and flabby. One hæmorrhagic area, otherwise rather pale; pulpa readily scraped off.

Stomach with greenish slate-colored mucus on the very pale mucosa. In the fundus there are some erosions. Very few tiny ecchymoses.

Liver, 2340 gm., very large, diffusely mottled with large, very plain lobules, yellow in the periphery.

Left kidney, 210 gm., large, surface remarkably mottled, not unlike the appearance of the liver. Cortex of moderate width. Capsules not much adherent. Right kidney, 180 gm., similar with an adhesion of capsule in one part in one depression only. One pea-sized tumor in the cortex.

Skull fairly regular. Rather dark bluish color. Almost complete obliteration of the sutures except at the bregma. Inside granite-gray, slightly mottled, with numerous depressions and a few hyperostoses, especially in the left frontal bone. Sulci of blood vessels broad and deep, not ragged. Only one translucent spot at the depression to the left of bregma.

Weight of clavarium, 340 (the average weight being 300-320). Inside of dura free on both sides. Pia slightly whitish with white strands over the anterior end of the first frontal fissure. Few Pacchionian granulations. No œdema. Between the two optic nerves a tumor appears. The Sella Turcica is considerably broadened out and broken in order to perceive the connections of the tumor. The tumor is visible in front of a transverse membrane extending between the two clinoid processes and protrudes beyond the chiasma as a cherry-sized body with two secondary excrescences beyond its capsule, both mulberry-shaped, one with 4 grains and the other larger, less plainly granulated, just over the left optic nerve.

Beneath the said ligament or membrane is the *chief portion of the tumor* between the two cavernous sinuses 18 mm. broad and deep. When bent forward the tumor from the chiasma to the tip is 22 mm. long. The infundibulum turns to the left and then towards the median line into the tumor at a point just over the posterior clinoid process which is over-ridden backward by the larger posterior part of the tumor. The third, nerves are perfectly free, the corpora albicantia flattened. On the left side, between the tumor proper and the cavernous sinus, there is a closer adherence and a soft smeary gray matter can be scraped out, probably contents of the tumor, which however did not appear burst.

The chiasma is considerably flattened and a distinct depression is seen between it and the beginning of the frontal bone.

The basal arteries with considerable atheromatous thickening and distinct calcareous deposits. No adhesion of the pia as far as it is removed.

The weight of the brain 1075 gm.

Spinal cord with one large arachnoid plaque; nothing else abnormal.

Anatomical Summary.—Tumor of hypophysis. Acromegalic malformation of face, hands and feet. Obliteration of sutures of skull. Hyperæmia of diploe and presence of several hyperostoses on inside of frontal bone. Very marked atheroma of basal, splenic and coronary arteries. Myocarditic scars. Atrophy of brain. Thickening of cords and margins of mitral valve and endarteritis of aorta. Numerous ecchymoses of epicardium. Œdema of lungs (slight). Slate-colored contents of bronchi. Enlarged liver, spleen and kidneys. Small tumor of left kidney. Subserous fibromata of uterus.

Epicrisis.—Our patient was an Irish woman of probably somewhat peculiar makeup, and later in life typical paranoic disposition. At the age of 46, she began to develop acromegalia, a change of her tongue, voice, face, hands and feet and she ascribes it to the worry produced by her persecutors. Later she developed diabetes and the first authentic report from a hospital describes her as peculiar, fault-finding, talking to the birds, etc.

At our hospital her mental condition is best described by the term "paranoic disposition" since her retrospective complaints as well as those referring to the time of the hospital residence were rather poorly systematized and fleeting.

It might be rather far fetched to see any correlation between her psychosis and the acromegaly. The observation of Pick, Hutchings, Garnier and Santenoise, Joffroy, Blair, Feindel and Worcester and several others* go to show that the mental disorders are either accidental or they are a certain degree of dementia accounted for by the presence of the tumor or of arteriosclerosis.

Among the physical features, the existence of a probably concentric restriction of the field of vision pointed to the existence of a tumor.

The findings concerning the hypophysis are the only feature to which we wish to devote a more careful discussion.

In order to spare the tumor as much as possible the posterior clinoid process was broken off with the tumor and measures of the Sella Turcica were not taken. It was distinctly widened and its walls soft, so that they broke readily. The posterior clinoid process makes a transverse depression on the basal side of the tumor. The anterior smaller part protrudes in front of the chiasma and shows *mulberry-like projections* beyond the original mem-

* See the bibliography of Brooks and his remarks on p. 560.

brane of the hypophysis; the posterior larger part of the tumor overlaps the posterior clinoid process backward and flattened the corpora albicantia. On the left side the tumor is somewhat adherent to the cavernous sinus and gray juice is found on that side after the removal although no point of rupture of the gland could be found. Beyond this there is absolutely no trace of propagation of the tumor into the neighboring tissues such as was present in the cases of Strümpell (l. c. pp. 79 and 80), Arnold, Osborne, (Wolf?), Pechkranz, Rolleston, Hanseemann, and Caton and Paul; but we shall presently see, that our specimens give very good illustrations of how this propagation takes place.

We start in our *microscopic description* from a section which gives the main body in its greatest (horizontal) circumference, and also a more superficial slice of the anterior projection with a fair preservation of the membrane. On the ground of this survey of the entire section we shall study the various distinctive portions. Although great care was used to preserve the limiting membrane perfectly intact there are a few small superficial defects corresponding to the presence of firmer connection with the surrounding tissue, such as was noted concerning the cavernous sinus.

The center of the tumor appears to be of the same structure as that in the cases of Strümpell and Brooks. There is an irregular and loose net of blood vessels, mostly between 6 and 10 μ in diameter, not infrequently 15 or even a few up to 80 or 100 μ . The average red blood corpuscles in the section measured as 4.5 to 5 μ . Even in the latter the wall is not thicker than 8.5 μ , and in most of the largest ones not over 3 μ . The largest vessel has a number of cross-sections of nuclei of the intima and a moderate number of circular nuclei in the fibrillary coat; the smaller vessels have only few longitudinal cells, and but very little if any adventitia. The rule is that the capillaries and even the larger vessels are directly surrounded by a layer of the parenchyma cells without any partitions of connective tissue, whereas in the case of a few larger vessels (arterioles and veins) one gains distinctly the impression that the parenchyma cells have invaded the adventitia and that a reticulum of connective tissue results which contains isolated cells or clusters of three to ten, and reminds one of the reticulated structure of a lymphgland. Some of the fibril-strands contain a capillary. Wherever the capillaries

are thin and far from the larger vessels they carry with them but very little connective tissue, so that the largest part of the interior of the hypophysis has the appearance of *loosely arranged cells, a certain number of which are held together by very thin-walled capillaries and but very rarely by a few strands of fibrils.*

Towards the surface the picture is different owing to the more concentric arrangement of the tissue-elements. The blood-vessels are more densely arranged and mostly parallel with the connective tissue capsule of the gland which consists of wavy fibrillae loosely arranged and has an average thickness of 200μ , a few flattened nuclei and a varying, usually small number of blood-vessels of the character of a sinus.

The same holds for the numerous and well-filled blood vessels of the subjacent tumor stratum, to the depth of 75 to 300μ . This stratum consists of a fine and regular net of strands of fibrillar meshes which either enclose blood—*i. e.* are sinus-shaped vessels with very scarce endothelial nuclei—or parenchyma cells. The strands which separate cell-nests show nuclei exactly like the endothelial nuclei mentioned but probably intramural.

The parenchyma cells hardly require much verbal description since the drawings represent them satisfactorily. They vary much in size, from a diameter of 8 to 10μ to 40μ and more. They are of round or triangular outline, with one nucleus in the smaller ones, two or more in most of the larger ones, mostly eccentric, and clear with a number of distinct granules and frequently one or even two fairly distinct nucleoli.

The protoplasm of the cells of the body of the tumor is mostly lightly stained with eosine, fairly homogeneous, occasionally with vacuoles; in the other sections most cells were stained light blue and only a small number with eosine. Since the reaction was not constant little weight is laid on this point beyond the statement that the more superficial cell-layers and those most compressed were mostly of a bluish tinge, and also many of the cells which formed plugs in the herniae of the membrane of the hypophysis.

In a limited part there are several areas of *lymphoid infiltration* among the ordinary parenchymatous tumor mass.

In several parts of the section there are isolated tubes or alveoli with *colloid substance* and somewhat flattened epithelium, otherwise not different from the other cells of the small type. These



FIG. 1.—Case of acromegaly with diabetes and paranoid development.



FIG. 2.—Base of brain with tumor (with the posterior clinoid process in position).

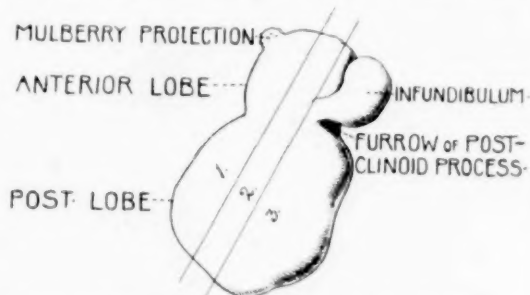


FIG. 3.—Hypophysis tumor with the planes of section.

Piece 1. With sequestered part of the nervous portion. (See Fig. 4.)

Piece 2. Without a trace of nervous portion.

Piece 3. With the principal part of the nervous portion (without nerve-cells).

The terms anterior lobe and posterior lobe are used purely topographically and not in the sense of differentiation of the normal gland.

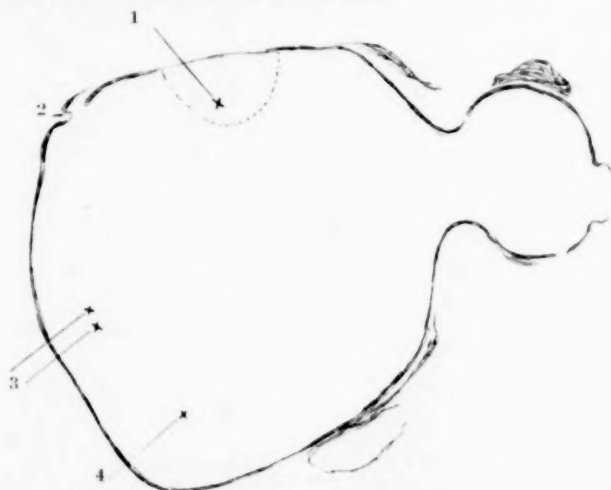


FIG. 4.—Section from block 1.

1. Sequestered nervous part with newly-formed neural cells (Fig. 9).
2. Break of capsule around a bone-spicule (mode of propagation, Fig. 8).
3. Positions of Figs. 5 and 6.
4. Colloid tube (isolated). (Fig. 7.) Much more numerous in block 3.

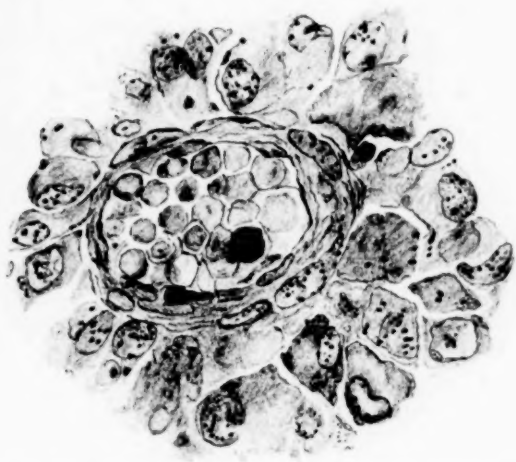


FIG. 5.—Groups of the otherwise loose cells around blood-vessels. Septa very scanty.

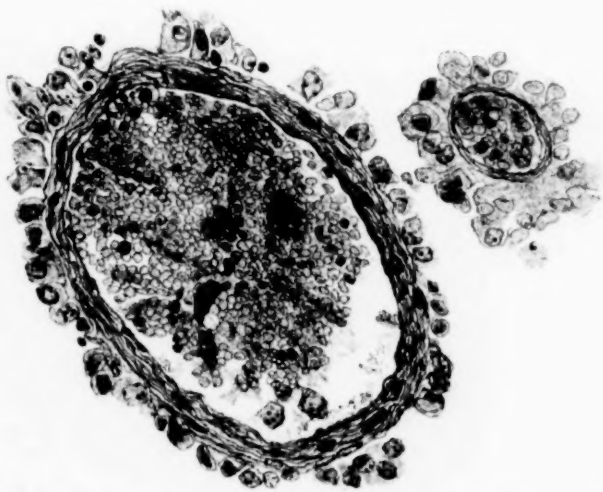


FIG. 6.—Groups of the otherwise loose cells around blood-vessels. Septa very scanty.

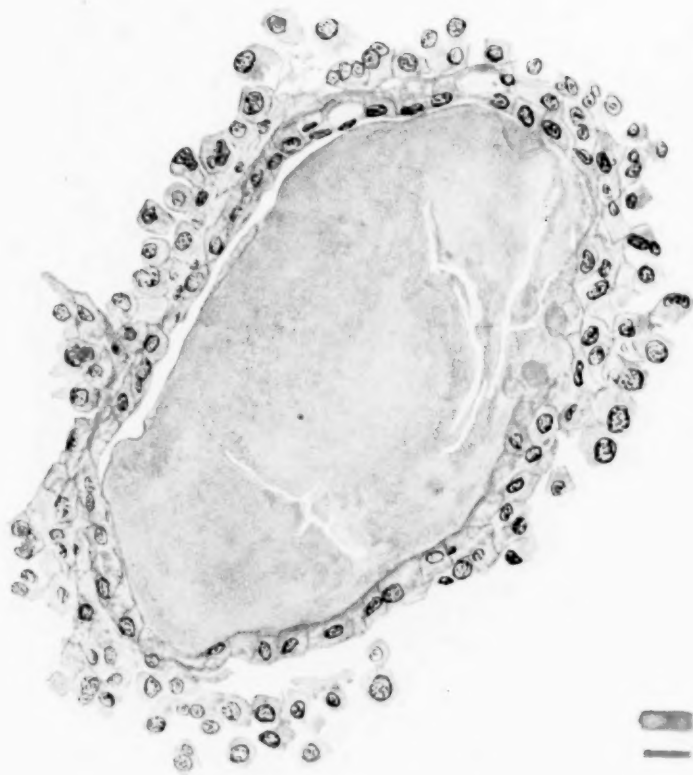


FIG. 7.—Colloid duct.



FIG. 8.—Breaking of the capsule by a bone-spicule. Beginning of mulberry-projections and of invasion of neighboring tissue.



FIG. 9.—Atypical neural cells in the sequestered part of the nervous portion.

Several of the cells have from 2-4 nuclei. Typical tigroid substance.



alveoli and colloid masses are, however, both smaller and less numerous than those of the normal gland where they are usually limited to the line of contact between the glandular and the infundibular part. The tubes occur also without colloid; probably through the retraction of the colloid mass; on the other hand there are colloid masses much decayed surrounded by only few and much flattened epithelia and still others in which epithelia have emigrated into the colloid mass, as in the colloid of the thyroid.

The most interesting feature of the tumor lies in its *mode of propagation*. The section shows various steps from the encroachment of the fibrous membrane and formation of cell-nests within its meshes, to the formation of hernias and the bursting into bone-tissue. The figures show this so well that a description is unnecessary. The smeary substance consisting of hypophysis cells and found in the Sella Turcica after the removal of the tumor may in part have emigrated in this manner. Another interesting way is illustrated by Fig. 8 where a bone-spicule has, as it were, punctured the membrane and given origin to a hernia into the membranes and to a prolapse beyond the membrane around the bone. Considering the care with which the tumor was removed, these findings are likely to throw some light on the cases of Arnold, Hanse-mann, Strümpell, and especially the case of Osborne which Prof. Bartlett has described and pictured very excellently.

Several peculiar findings led to the observation that the nervous part of the hypophysis was at one point so invaded or distended that one portion became completely detached from the rest and formed *an independent island of the nervous portion* on the glandular tumor. A striking *monstrosity of both glandular cells and of the cells of the nervous portion* was present only in this island. The lamina of the tumor in which this island was found is separated by a lamina without any nervous portion from the part to which the infundibulum is attached. A section parallel with the axis of the infundibulum and perpendicular to the primary laminae showed that the nervous part was hypertrophic and spread as a cap over part of the tumor. In some parts it was invaded by mostly solid tubes of glandular cells, which were, however, nowhere out of contact with the tumor mass, after the type of metastases. There were also, a number of larger colloid

lumps of up to 1.4 mm. in diameter at the limiting line, as in the normal hypophysis. The infundibular part consisted chiefly of the normal neuroglia tissue.

This condition is considerably changed in the *sequestered island of the nervous portion*. In the normal hypophysis the transition is sudden and very plainly marked, especially because this is the place of the frequent colloid nests. In this part of our tumor the transition is slurred over and the stroma of the tumor goes over without limit into the stroma of the nervous portion. Moreover, there are the following cell-changes:

1. The glandular elements are larger and have a greatly increased number of nuclei.
2. While the numerous normal pituitary bodies at our disposal show no distinct nerve-cells, but only more or less well defined spindles of the character of neuroglia, with faint cell body and slender fibrils, the present tumor shows unquestionably a new formation of nerve-cells besides the existence of enlarged neuroglia-elements. A section from a rat-embryo shows very plainly a stage of development at which these cells are quite like those forming the thalamic nuclei or the other embryonic cell-masses of the neural tube. Later the differentiation goes in various directions, and in the "posterior" or nervous part of the hypophysis mainly towards the formation of the neuroglia. But in our case there is an abnormal development of the relatively slumbering elements such as I have not seen anywhere else and the occurrence of which, indeed, I had considered improbable. In distinction from the numerous claims of *new formation of ganglion cells* in descriptions of neuroglioma ganglionare these cells show *very distinct Nissl-bodies*.

But the elements of this part of the tumor are in other respects a veritable hot-bed of *monstrosities*. The chief feature is the atypical hyperplasia of all the elements along the zone of contact of the glandular and the neural portion, and intermingling of these elements which goes so far as to create serious difficulty for a plain division into neural and glandular products. The common features are the enlargement of the cells as a whole, the multiplicity of the nuclei and the presence of one fair-sized nucleolus, even in many nuclei of the hypophysis cells. Thus, one section shows *three nuclei in a nerve-cell*, and several hypo-

physis cells look so much like nerve-cells that it is almost questionable whether a line of distinction can be drawn with absolute safety. This is especially the case because a few of the hypophysis cells seem not quite devoid of granules which stain with methylene blue.

These findings show plainly some of the risks run by those who merely examine one or two isolated slices of such a tumor. We have found areas which suggest normal hypophysis, others which might be taken for a glioma; other parts might be interpreted as sarcoma; the plugs of hypophysis cells, if not examined in serial sections might make one think of cancer, etc. This is what stares one in the face on looking over the literature. There is such variance that one would hardly trust the view that there is after all one lesion of the hypophysis typically connected with acromegaly. The confusing nomenclature and the frequently poor description and often the lack of illustrations, together with many features giving collateral evidence of the not altogether reliable judgment of some of the writers, should be considered before we refuse the increasing possibility of a common unit in these tumors which appears to be the *conditio sine qua non* of their association with acromegaly and conclusive evidence in favor of the views of Tamburini, Brooks, and others.

This view is endorsed by several lines of argument. Destructive lesions of the hypophysis (absence of the hypophysis, or destruction by tumors) are not associated with acromegaly. This is shown in the cases of gumma (Beadles, Hunter), tubercle (Schmidt), etc. One of the recent cases brought into connection with this question is the one of Burr and Riesman. The writers fulfill the requirement of giving a drawing of a section of the tumor, which is a spindle-cell sarcoma. It leaves intact a certain amount of normal tissue of the hypophysis. The writers conclude that "acromegaly is caused by disease of the hypophysis, and that for its production the lesions must be complete, i. e., must affect the entire glandular structure"; a conclusion which could hardly be supported now. The "cases of acromegaly" without tumor of the hypophysis also furnish evidence for the view of a uniform alteration of the hypophysis in true acromegaly. They prove to be either poorly examined, poorly reported or belonging to the group of secondary hyperplastic osteopathy. Schmidt uses

against the hypophyseal origin Waldo's case—although there was a caseating mass in the lungs; Dallemagne's case III, which (together with his case II) lacks conclusive descriptive evidence for the existence of true acromegaly, beyond Dallemagne's assurance that they were cases of acromegaly (a conclusion which one does not like to let pass in the face of other evidence of rather hasty reasoning in connection with his first case, in which he lays weight on the presence of scattered glia nuclei near the central canal of the cord and on small encapsulated gliomata in the bulb, and concludes that since the hypophysis is merely the anterior end of the central canal these proliferations of glia-cells and the sarcomatous tumefaction of the hypophysis are all of the same order); and the case of Hobschewnikoff (syringomyelia). Bonard's description of a "normal" hypophysis gives too large measures to really justify this verdict, and Hunter's and Linsmayer's cases are eliminated by Schmidt as normal with too little evidence whereas, to me, their description appears convincing that they were adenomata.

The great difficulty seems to rest on the heterogeneous nature of the positive cases. Through the kindness of the librarian of the surgeon general's office, I was able to go through all the original descriptions of the tumors in question, and the conclusion is as follows:

Many of the descriptions are very defective and but few are accompanied by adequate drawings. Neither description nor name of the tumor are given by Ponfick, Squance, Thomson, Lathuray, Cunningham and Rathmell. Comini, who describes a tumor quite analogous to ours, abstains from naming; also Duchesneau, and Boyce and Beadles. The terminology used is obviously tentative with most writers. Gauthier calls the contents of the tumor "pulpe cérébrale" and says there were no other elements but those of normal "pulpe cerebrale." Dana and Fratenich speak of colloid degeneration and Lanceraux of a tumor containing liquid. Mosse et Daunic speak of a "sarcoma neuroglique fuso-cellulaire fasciculé," Bury of a glioma (without details), Levy of a malignant tumor.

Sarcoma is the term used by Dallemagne, McJohnston, Strümpell (1), Strümpell (2), Uhthoff, Osborne, and, without description, by Griffith:

Medium-sized round-celled sarcoma by Rolleston.

Round-cell sarcoma by Caton and Paul and Spiller.

Large-celled sarcoma by Pineles.

Sarcomatous struma by Hanseman.

Sarcoma globocellulare angiomatodes by Pechkranz.

Spindle-cell sarcoma with psammomatous degeneration by Worcester.

Cylindroma by Wolf.

Roxburg and Collis hesitate over something midway between a glioma and a round-cell sarcoma; Arnold between lymphadenoma and sarcoma, Dalton between sarcoma and hypertrophy.

Claus and Van der Stricht see in it a *lymphoid tissue* with secondary necrosis (Van der Stricht had described analogous lymphoid changes in the stomach and liver in leucæmia the year before); Sigurini and Caporiacco a *lymphadenoma*.

The term *adenoma* is used for part of the hypophysis by Linsmayer, and for the whole by Tamburini, Boltz, Bailey, Henrot, Fritsche and Klebs, Holsti, Godlee, Mitchell and Le Count.

Adenoma or simple hypertrophy by Furnivall, Marie and Marinresco, Cepeda, Bourneville, Brooks.

Adenoma or goitre by Shattuck.

Vascular hypertrophy by Hunter, and Brigidi.

Schultze and Jores waver between "*angiosarcoma and hyperplasia or adenomatosis*"; Buday and Jansco between *adenosarcoma and angiosarcoma*.

The description of the elements of the tumor shows far greater uniformity than the nomenclature would suggest. The tumors described as sarcoma and as adenoma allow mostly a perfectly conclusive identification. Those with qualifying adjectives show mostly efforts that would point to the same interpretation. Types of most refractory forms are those of Worcester, Wolf and Spiller. Wolf's drawing leaves one in doubt; Dr. Spiller's preparation shows plainly the hypophysis cells of our tumor and Dr. Worcester's case also. Bury's glioma I am inclined to recognize in a hypertrophic posterior lobe and Mossé and Daunic's term "*sarcoma névroglique fusocellulaire fasciculé*" shows plainly the effort to harmonize the various elements such as we have also in our tumor.

Our conclusions are:

1. The change in the hypophysis in acromegaly seems to be

more uniform than the descriptive terms in the literature would suggest. The differences of opinion may be due in part to a limitation of the examination to one or few portions of the tumor.

2. The change found in our case is identical with that described by Brooks. It shows also the mode of propagation of the tumor.

3. In a sequestered part of the nervous portion unmistakable new formation of nerve-cells with Nissl-bodies has occurred beside other monstrosities.

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A STUDY OF THE BRAIN IN A CASE OF CATATONIC HIRNTOD.*†

By SAMUEL T. ORTON, M. D.

(From the Laboratory of the Worcester State Hospital, Massachusetts.)

Those cases of mental disease which show at autopsy no demonstrable gross lesions of a character sufficient to be assigned as causes of death and in which both bacteriologic and microscopic examinations fail to reveal any further evidence of importance, yield material which justifies intensive study.

The case here reported seems to be such a case of true Hirntod and while the patient had been an inmate of this hospital for only five days and the psychosis had outwardly existed only a few days more so that its type cannot be definitely determined, it seems to have been a case of acute catatonic excitement of the dementia præcox group.

The case is that of a young unmarried girl of 22 years, whose psychosis appeared with sudden onset about July 25, 1910. She was admitted to the hospital August 4, 1910, and exhibited continued restlessness, was resistive and showed marked affect of fear with occasional exclamations. She was for the most part mute and negativistic though on the second day after continued urging the following results were obtained:

How do you do? *Pretty well.* Where are you? (Looks away from physician.) Do you know where you are? *Yes.* What place is this? *Rutland.* Is it your home? *No.* Are you sick? *No, I have not had any real sickness.* Why are you in bed? (No response.) Why do you not answer? (No response.) Show your tongue. (After a long pause finally does so.) Have you any pain in your head or anywhere? (No response at first—finally shakes head in negation.) Are you worried? (No response.)

She failed to respond to the ordinary hydrotherapeutic measures to reduce the restlessness and at 2 p. m. on August 9, 1910, on the

*This paper forms contribution number ten of the Worcester State Hospital (Mass.), Series of 1912, offered in compliment to Dr. Hosea Mason Quinby on the event of his retirement from the Superintendency after 20 years of service.

†Read at the sixty-eighth annual meeting of the American Medico-Psychological Association, Atlantic City, N. J., May 28-31, 1912.

fifth day after admission began to collapse rapidly. Stimulants were exhibited but with no avail and she died at 5.45 p. m.

The anamnesis reveals the fact that the patient's father was a chronic alcoholic of French-Canadian descent who though a good workman could not keep employment long on account of his alcoholism. The mother was an English woman of an irascible disposition subject to outbreaks of temper in marked disproportion to the aggravating stimulus. The mother died of Bright's disease at the age of 53, when the patient was 16 years old, and the father sold the furnishings of the house and with the proceeds started on an extended alcoholic debauch leaving the patient to shift for herself. She was taken into the family of one of her school companions with whom she lived for two years. Most of the anamnesis obtainable is from this family though corroborated by her employer of the year succeeding. She was described as an "odd creature" with a tendency to aloofness, preferring to be alone, not fond of social amusements, "cranky one day, angelic the next"; as a rule rather stupid though with a varying amount of evinced brilliance. Her morals were good as far as were known and she used no alcohol or drugs. She was subject to fits of anger on minor provocation.

She had little company and very few friends and one of her favorite amusements seemed to be to walk alone in the evenings.

No account is obtainable of her history during the two years before her admission to this hospital. Permission for the autopsy was unfortunately not obtainable until 25 hours after death.

The necropsy protocol was as follows:

Body of a well-developed and well-nourished white female. Body heat absent. Rigor present. Lividity rather marked posteriorly and over all of left arm. The anterior aspect of trunk and all four limbs shows numerous purplish red ecchymoses of varying size. There are also a number of greenish discolored areas (bruises).

Peritoneal Cavity.—Panniculus adiposus 2 cm. Appendix retro-cæcal and apparently lies beneath the cæcal peritoneum.

Pericardial Cavity.—The pericardium over a small portion of its anterior surface is dry and translucent and brittle to the scissors, lightly adherent to similar dry patch on visceral pericardium. Remainder of pericardial cavity normal.

Pleural Cavities.—Normal.

Heart.—Wt. 240 gm. Tricuspid valve 11.5 cm. Pulmonary valve 6.5 cm. Mitral valve 11 cm. Aortic valve 5 cm. Endocardium of left ventri-

cle shows a large area of diffuse hæmorrhagic staining. Valves all normal. Myocardium 1 cm. and rather pale but of fair firmness. Base of aorta clear. Coronaries normal.

Lungs.—Both crepitant. Anterior borders of both salmon pink. Posteriorly considerably darker. Cut section of posterior portion very dark. No excess of fluid. Large quantities of dark fluid blood expressible from vessels.

Spleen.—Wt. 210 gm. Capsule smooth, rather light in color. Pulp soft, mottled pink and plum color. Trabeculæ and corpuscles not visible.

Liver.—Wt. 1550 gm. Capsule smooth and thin. Liver substance friable. Color on section is a dark mahogany with an indistinct mottling of yellowish gray.

Gastro-Intestinal Tract.—Negative.

Pancreas.—Very soft.

Kidneys.—Wt. 205 gm. Capsule strips easily leaving a smooth surface. Cortex averages 6 mm. Cortex of a homogeneous purplish gray. Glomeruli visible as very delicate glistening points.

Adrenals.—Normal.

Genitalia.—External surface of cervix deeply congested. Cervical canal contains a small plug of clear mucus. Several follicular cysts in either ovary. One small corpus luteum in left ovary.

Aorta.—Normal.

Calvarium.—Thin. Wide line of diploe everywhere. The external surface of both parietal bosses shows a purplish color. Section through this portion shows a very thin external table and a wide purplish band of diploe. Deep depressions of Pacchyonian granulations. Dura translucent in frontal zone, slightly more opaque posteriorly. Pia thin and translucent everywhere. Considerably congested in finer capillaries.

Brain.—Wt. 1300 gm. Convolutions of good width and well approximated. Palpation reveals very little variation in firmness. The whole brain is soft and except for the normal firmness at the poles and a slight questionable increase in resilience of the superior frontal and precentral convolutions there is no difference. Floor of 4th ventricle smooth. Cerebellum soft throughout.

Basal Vessels.—Thin and delicate.

ANATOMICAL DIAGNOSES.

Exhaustion of catatonia.

Multiple superficial ecchymoses.

Congestion of diploe in parietal regions.

CULTURES.

Heart.—No growth in agar at 48 hrs.

Spleen.—No growth in agar at 48 hrs.

Liver.—No growth in agar at 48 hrs.

MICROSCOPICAL EXAMINATION.—TRUNK.

SHARLACH R. STAIN.

Heart.—No intrafibrillar fat.

Spleen.—No fat.

Liver.—Moderate amount of fat in small and large droplets at the peripheries of the lobules.

Kidney.—Marked diffuse pink staining throughout both cortex and medulla. No definite droplets.

EOSIN METHYLENE BLUE STAIN.

Heart.—Pericardium delicate. Moderate layer of fat spaces. Endocardium thin. Muscle fibres well formed and well stained. No perinuclear pigmentation or vacuolization. No excess of fibrous tissue. Vessels normal.

Lungs.—Alveolar walls thin and delicate. Some of the capillaries show a moderate engorgement. The alveoli contain a few desquamated epithelial cells but no exudate.

Spleen.—Capsule of moderate thickness. Pulp shows very marked congestion. Vessels normal.

Liver.—Capsule thin. Capillaries markedly engorged. Moderate number of small fat vacuoles chiefly in cells at peripheries of lobules. In some of the areas where the congestion is intense there is some narrowing and slight fragmentation of the cell columns. No increase in connective tissue.

Large Intestine.—The more superficial parts of the mucosa show fragmentation and a very faint staining reaction and contain myriads of bacteria of several sorts. There is however no reactive exudate in the subjacent layers. (Change is probably post-mortem disintegration.)

Pancreas.—For the most part the cells of the pancreatic acini preserve the normal outline and show a relatively normal staining reaction though many of them give evidence of a granular eosinophilic change of minor grade. In a few small areas this autolytic change is more advanced and the cell arrangement is lost, leaving only a scattered group of nuclei with fragments of protoplasm. The islands of Langerhans are apparently normal. Ducts and vessels normal. No increase in connective tissue.

Kidneys.—Capsule thin and delicate. Cortical epithelial cells are somewhat swollen, very finely granular and in places a little fragmented. The cortical and glomerular capillaries are engorged. Glomeruli otherwise negative. Pyramidal tubular epithelium well preserved. Capillaries in medulla engorged.

Adrenals.—Capillaries markedly engorged. The cells of middle zone of the cortex show a very marked vacuolization. The deeper cortical cells contain a very large amount of pigment which is in a very finely divided state.

Uterus.—Mucosa and vaginal epithelium normal. In a few small areas the muscle fibers are a more glistening pink than normal, and rather sparsely supplied with nuclei giving the appearance of an early hyaline change.

Fallopian Tube.—Pattern intricate. Villi delicate. Vessels engorged. No exudate. This specimen also includes a section of a hydatid which appears as a thin walled cyst with a fibro-muscular coat lined with a slightly flattened cuboidal epithelium.

Ovaries.—Contain a rather small number of primitive ova. Several corpora lutea in various stages. The cysts are simple and in addition to detached fragments of epithelium contain only fine granular pink staining debris.

Thyroid.—Alveoli moderately well filled with colloid. Ratio of colloid to epithelium about normal. Epithelium not flattened. No evidence of inflammatory exudate.

Pituitary.—Capillaries engorged. Acidophilic cells of the glandular portion are in rather higher proportion than usual. In a number of places the epithelium of the acini seems to have undergone a change resulting in a marked enlargement of the cell body which takes on a finely granular neutrophilic appearance. Their nuclei are for the most part pyknotic though here and there a large vesicular nucleus is visible and occasionally one with a gigantic nucleus. These cells as a rule occupy one acinus or group of acini but in some places they can be seen interspersed with the two normal types in the same gland. There are a few small cysts along the line between the nervous and glandular portion. The nervous portion shows nothing unusual.

MICROSCOPICAL DIAGNOSIS.

Widespread venous and capillary engorgement.

Slight post-mortem change in intestines.

Simple ovarian cysts.

Slight post-mortem autolysis in pancreas.

The brain was preserved *in toto* in 10 per cent formalin. The gyral pattern is one of moderate intricacy.

RIGHT HEMISPHERE.

In general it may be said that the arrangement of gyri and sulci of this hemisphere is well within the normal variations. Both the precentral and postcentral gyri are interrupted by shallow sulci. There is a sulcus of moderate length arising from the lower arm of the terminal bifurcation of the parieto-occipital sulcus and running downward and backward across about two-thirds of the lateral aspect of the occipital pole thus corresponding in part with the position of the so-called Affenspalte. The precentral sulcus follows the common arrangement of separate superior middle and inferior divisions. The postcentral sulcus is not represented by either inferior or superior divisions while the sulcus in the position

of the middle division gives rise to the ramus horizontalis of the interparietal, thus suggesting that it in reality is made up of the rami ascendens and descendens of the interparietal and that the postcentral sulcus is absent, an unusual though by no means rare arrangement. The point where the common calcarine trunk divides into the calcarine and parieto-occipital is high, and the angle of divergence between these two sulci is more acute than usual, giving a rather small and narrow cuneus.

LEFT HEMISPHERE.

As on the right both the precentral and postcentral gyri are interrupted. The superior and middle divisions of the precentral sulcus are confluent. The two arms of the interparietal on this side also take the place of the middle division of the postcentral sulcus. This hemisphere, however, shows short sulci occupying the positions of the inferior and superior divisions. The ramus ascendens of the interparietal has a more forward trend than usual so that its extremity reaches almost to the rolandic. The point of division of the calcarine trunk is not so high on this side and the angle between the parieto-occipital and calcarine less acute so that the cuneus has more its usual shape and size.

The microscopic examination of the brain has been carried out along several lines. Sections for study by a variety of methods were taken from 30 different areas of one hemisphere.

For the stratigraphic review of the various cortex types paraffin sections cut at 10μ on a Bausch and Lomb Minot Automatic Precision Microtome and stained in toluidin blue or in thionin were employed. Similar sections stained by Mallory's original neuroglia stain (picric acid and ammonium bichromate mordanting and phosphotungstic acid hæmatein staining), were used for the display of the neuroglia fibers. The Bielchowsky silver method was applied both by the block and section technique. One set were stained by the Herxheimer method for the study of the Sharlach stainable lipoids. Alzheimer's methods IV and VI were used for the study of the ameboid glia cells. The first of these methods, *i. e.*, frozen sections from blocks mordanted in Weigert's glia mordant and stained in a weak solution of Mallory's phosphomolybdic acid hæmatoxylin has proven the better for a study of the neurophagic glia cells of the cortex while the second method has given the better pictures of the ameboid forms in the white matter.

The areas from which blocks were taken for study were as follows:

Block.	Area.
1.	Motor cortex. Leg area.
2.	Motor cortex. Arm area.
3.	Motor cortex. Face area.
4.	First frontal gyrus. Frontal field.
5.	First frontal gyrus. Fronto-prefrontal field.
6.	Second frontal gyrus. Frontal field.
7.	Second frontal gyrus. Fronto-prefrontal field.
8.	Frontal pole.
9.	Third frontal gyrus. Near Anterior Sylvian.
10.	Postcentral opposite No. 1.
11.	Postcentral opposite No. 2.
12.	Postcentral opposite No. 3.
13.	Parietal cortex. Above interparietal sulcus.
14.	Parietal cortex. Mesial surface.
15.	Second temporal gyrus. Posterior end.
16.	Second temporal gyrus. Anterior end.
17.	First temporal gyrus. Anterior end.
18.	First temporal gyrus. Posterior end.
19.	Transverse temporal gyri. Auditosensory field.
20.	Third temporal gyrus. Middle.
21.	Occipital cortex. Lateral surface. Visuopsychic field.
22.	Occipital cortex. Lateral surface. Visuopsychic field.
23.	Occipital cortex. Inferior surface. Visuopsychic field.
24.	Occipital cortex. Mesial surface. Visuopsychic field.
25.	Occipital cortex. Beneath common calcarine trunk.
26.	Occipital cortex. Middle of cuneus.
27.	Occipital cortex. Below angle of cuneus.
28.	Hippocampal cortex. Behind peduncle.
29.	Cornu Ammonis. Beneath No. 28.
30.	Frontal pole orbital surface.

In addition to these areas material was examined from various parts of each half of the cerebellum and from the vermis, from both red nuclei, from both dentate nuclei, from two levels of the medulla and from six levels of the cord, while the condition of the Betz cells was studied by several methods in sections from 12 areas in addition to those listed.

TOLUIDIN BLUE AND THIONIN STAINS.

Precentral Cortex.—(Sects. 1, 2 and 3.) The cells for the most part are well formed though some are a trifle too angular and show

evidence of slight shrinkage. (Formalin fixation?) The majority of the cells have taken the stain well and show a good complement of Nissl bodies. As the deeper cell layers are reached, however, an occasional large pyramidal cell is encountered which shows marked lessening in its content of tigroid bodies giving it a pale blue washed out appearance. Among the Betz cells this condition is widespread. In a count of 2000 cells conforming in size, morphology and position to the Betz type from sections taken from 15 different areas of the motor cortex of both sides, only seven cells were met which contained any Nissl bodies, while in these the content was low and the individual granules small. The condition of the cells of this type is a variable one, but the essential features group themselves to a considerable extent in accord with the fatigue processes in nerve cells as described and illustrated by various observers. In other particulars, however, this apparent similarity to the cell changes resultant on fatigue is not so apt. The writer has been able to find no mention of granular deposits in the protoplasm of nerve cells after excessive stimulation while in a number of the cells of the present study this factor is a fairly prominent one.

In both toluidin blue and thionin preparations of these cells this type of granule appears as a faint yellowish or greenish stippling of a fairly sharply demarcated area of the cell body or as larger regular spherical masses of much the same color and similar clustered distribution. Comparative studies of these granules show that they do not stain by the osmic acid nor Sharlach R. methods for fat, and that they are not fuchsinophilic in the osmic-acid-lichtgrün-acid-fuchsin preparations (Alzheimer's Method VI), and that in the dilute phosphomolybdic acid hæmatoxylin stain (Alzheimer's Method IV) they stand out clearly as darker granules on a comparatively homogeneous background.

Omitting, however, for the moment this granule content, if one compares the appearance of the Betz cells with the description of fatigued nerve cells all the characteristic stages, progressive loss of Nissl bodies and of the chromatin content of the nucleus and nucleolus, together with shrinkage and distortion of the nuclear outline, are easily recognized. Plate I. It seems probable that these steps of degeneration or at least deterioration may be common to both fatigue and disease processes and yet the finding here of a

fatigue-like picture in the motor cortical cells when coupled with the extreme motor restlessness before death is interesting.

So far this description has dealt with the Betz cells and while they show the changes in greater or less degree in every cell observed, the condition is by no means confined to these elements, as here and there throughout both the internal and external layer of large pyramidal cells are to be seen large and small pyramids which exhibit a very similar picture. Here, however, the action is by no means so widespread, as approximately only one cell in three or four of this type is affected. The granule content of these cells is by no means so prominent as in the case of the Betz cells, though an occasional cell is seen containing similar granules. Many of the cells of these laminae show a breaking up of the cell outline with shrinking and vacuolization of the protoplasm not found in the larger cells.

In the cells of the more superficial layers and in the fusiform layer the staining reaction is much more normal though even here an occasional cell with very faint protoplasm and even fainter nucleus bespeaks a condition of things like that described above. There is a moderately definite satellite reaction in the lower cell layers though nowhere excessive in this type of cortex.

Postcentral Cortex.—(Sects. 10, 11 and 12.) Here again scattered elements throughout all layers show the same grades of alteration, but the total number of affected cells of this cortex is much less than that of the foregoing and it is noticeable that the giant cells of the internal layer of large pyramids—the strati-graphic and morphologic homologues of the Betz cells—are comparatively free from alteration of any kind and for the most part are well equipped with tigroid bodies. The satellite content of this cortex is definitely less than in the precentral.

Frontal Cortex.—(Sects. 4 to 9 inclusive.) This group of sections covers a wide field and several kinds of cortex arrangement but their characteristics are such that for this description they may be grouped together. In all there is a considerable number of cells giving the same washed-out appearance as those in the former cortices. Counts of considerable numbers of cells indicate that about one in four or five of the large pyramids and one in three of the smaller cells have suffered. This is a reversal of the order found in the precentral and postcentral gyri where the larger cells

were more frequently altered. Here again the lower layers show a moderate satellite reaction.

Parietal Cortex.—(Sects. 13 and 14.) The sections from this area show a very much more normal appearance than any of the foregoing. The results of the chromolytic process can be seen in some cells and the lower layers show a slightly greater number of satellites than would be considered normal but on the whole the cortex is in good condition.

Temporal Cortex.—(Sects. 15 to 20 inclusive.) Here again several cortices may be grouped for description. As a group these may be well compared with the postcentral. Chromolysis is in evidence in many cells—more noticeably the larger pyramids and to a less extent in the smaller. In section No. 19 which is taken from the transverse temporal gyri of Heschl, *i. e.*, the audito-sensory field, especial attention was paid to the characteristic giant pyramids of the external layer of large pyramids. These cells while not of the same layer as the Betz cells and giant pyramids of the postcentral cortex may yet by reason of their distribution and size be considered cells of a specialized function. Among them chromolysis is found, but by no means with the same frequency as in the Betz cells. A count of 100 cells has yielded a ratio of one faded cell to four and one-half more nearly normal.

Occipital Cortex.—(Sects. 21 to 27 inclusive.) In sections of both visuopsychic and visuosensory type the changes are advanced. In both, the large cells have suffered almost exclusively. In the visuopsychic type the larger elements of the external layer of large pyramids and in the calcarine cortex the solitary cells of Meynert show changes which while not involving all cells of these two types and not excluding other smaller cells yet compare aptly with the widespread changes found in the Betz cells.

Hippocampal Cortex and Cornu Ammonia.—(Sects. 28 and 29.) These two cortices have suffered in a much less marked degree than any of the foregoing. In both there are occasional cells showing the same faded-out appearance but they are few in number. The cornu ammonis, however, shows a fairly well-marked satellite cell reaction. The cells of the red nuclei and of the nuclei of the medulla are for the most part well-preserved and well-stained. An occasional faint washed-out cell is seen in the medullary nuclei but their number is very small when compared

with cells showing the same type of change in the cortex. Special attention paid to the motor nuclei of medulla failed to reveal any greater number there than in other cell clusters. The Purkinje cells of the cerebellum and the cells of the dentate nuclei are likewise approximately normal in their reaction to the stain. The anterior horn cells of the spinal cord (4 levels) have also received special notice on account of the changes above noted in the cells of the upper motor neurone. Here again the cells are well formed and contain well stained Nissl bodies in good numbers. Many of the larger cells of the anterior horns show considerable lipochrome pigment.

Sections stained by the Marchi method have been taken from four areas of motor cortex on each side with blocks for comparison from frontal, parietal, superior temporal and calcarine cortices.

In all sections the most striking feature is the accumulation of small blackened droplets around the vessels. Almost every small vessel in the white matter and many of those in the cortex is surrounded by a greater or less number of small black spherical drops. Some of the larger vessels also show droplets but by no means in as large quantities or as constantly as the smaller.

In the ganglion cells there are many very minute droplets, generally with a diffuse or supranuclear arrangement such as that found in the Herxheimer preparations. It is noticeable here, however, that the Betz cells are almost entirely free of stained material and that the clumps corresponding to the yellowish granules described under the thionin and pictured in Plate I, Figs. C and D, had failed to reduce the osmium.

There are scattered throughout the white matter a few individual fibers which have blackened to a greater or less degree but their number is small and is apparently no greater in the motor cortex than in the other cortices used as controls. Their total number in the subcortical white matter of the motor cortex is not as great as would be expected were they the degenerated axone sheaths arising from the Betz cells.

In those sections of this series examined with a carbol-fuchsin counter stain, the Betz cells show the same condition of faint colorability noted in the thionin specimens while in those by the Marchi method without a counter stain they can scarcely be identified.

PHOSPHOTUNGSTIC ACID HÆMATOXYLIN STAIN.

The neuroglia fibril content of the various cortices may be readily grouped together in one description. The surface mat is everywhere thin and delicate and made up of a loose meshed network of very fine fibrils with no undue extension into the zonal layer. No deep cortical or perivascular foci of increase of fibers were observable.

BIELCHOWSKY SILVER STAIN.

The intensity of the reaction to the silver stain is very varied and apparently closely parallels the colorability by the thionin stain. In no cell were there any swollen deeply stained fibrils of the Alzheimer type of alteration. The lack of fibers on the other hand in many cells is noticeable. A negative picture of this sort by the silver methods does not of course carry the weight of a positive result and yet the findings seem to warrant inclusion here. In all the cortices many cells can be found with an abundant supply of delicate intracellular fibrils but associated with these are other cells in which the fibrils are much reduced in number or entirely absent and their occurrence in various fields parallels quite closely the number of cells which reacted abnormally to the thionin and toluidin blue stains.

HERXHEIMER STAIN.

Sharlach stainable substances are scattered throughout many ganglion cells of the cortex and in many of the glia cells as well. In addition many accumulations of large lipoid droplets in cells collected in perivascular spaces were noted. Almost without exception the stained droplets in the pyramidal cells are small and scattered widely throughout the protoplasm. In many there is a tendency toward accumulation in a supranuclear position which is in contrast to the basal clumps found in the cells in senile conditions. The droplets in the neuroglia cells are noticeably larger but uniform while those in phagocytic cells of the perivascular spaces are variable, but all much greater in size than either of the foregoing. Figs. 5 and 6, Plate II, give an idea of the relative size of the lipoid droplets. The ganglion cell with an associated ameboid glia cell is from the internal layer of large pyramidal cells of the first frontal gyrus orbital surface (Sect. No. 30), and the vessel

is from subcortical white matter of the hippocampal gyrus (Sect. No. 28).

Examination as to the comparative intensity of reaction in the various areas has yielded little. No one area nor any particular group of cells seems to have suffered in disproportionate degree. In all cortices cells of every size can be seen showing similar changes though the larger cells by reason of their size show the droplets to better advantage. The large majority of cells of all types show no Sharlach reaction but in almost any high power field may be seen one or more cells which show a stippling in greater or less degree. Similarly the glia cells are for the most part free of droplets. In cells of this type, however, it is distinctly noticeable that those in close association with either ganglion cells containing droplets or vessels with droplets in the surrounding spaces are more apt to contain lipoids than those not so associated. Especially is this true of the group of glia cells which are not producing fibers, and which by their relatively large though difficultly stainable supply of protoplasm and by their peculiar shape group themselves with the ameboid glia cells of Alzheimer. The cell in Fig. 5, Plate II, at the base of the pyramid is of this type. The fat-packed cells in the perivascular space in Fig. 6, Plate II, are probably cells of mesodermal origin and the writer is inclined to group them with the endothelioid phagocyte type. Their content of fat as may be seen from the illustration is large in quantity and in large droplets and it is readily noticeable that cells of this type and in this position are the only ones where accumulations of like size and quantity occur.

ALZHEIMER'S METHODS IV AND VI.

These two technical procedures have been used for the study of the ameboid neuroglia cells. At the time of the beginning of this study the writer was unfamiliar with either method and the results while positive in most areas were not of sufficient constancy to allow of much deduction concerning the comparative numbers of these forms in various fields. In the description of the thionin preparation brief mention is made in several cortices to the presence of satellite cells in greater or less numbers, and in general it may be said that these areas were most fruitful in the search for the type of satellite which includes the neurophage, and which by reason of the production of a variety of pathological

granules occurring in its protoplasm have been included by Alzheimer with the ameboid neuroglia cells. In all cortices these cells could be found closely approximated to the pyramids and frequently lying in lacunæ of the ganglion cell protoplasm. Their number is not great but their size, position and staining reactions place them unquestionably with the ameboid glia cells. By the dilute phosphomolybdic acid hæmatoxylin stain they show as a rather dense nucleus surrounded by a poorly defined and not very sharply stained protoplasm, which is generally homogeneous or very finely granular in appearance though frequently stippled with coarse granules, taking a more intense stain than the matrix in which they lie. By the light-green-acid-fuchsin stain the protoplasm is a pale green, the chromatic particles of the nucleus dark green. Scattered through the light green protoplasm are granules of bright red and occasionally of dark green—the fuchsinophile and licht-grün granules. By the thionin stain the outlines of these cells are very faint and frequently indiscernible, but the granules which take the blue stain are frequently seen grouped around an otherwise barren nucleus. Fig. 4, Plate II, shows an ameboid glia cell applied to the body of a pyramid and in the protoplasm of each may be seen numerous fuchsinophile granules. The protoplasm of the glia cell is here not coextensive with the distribution of the granules giving the impression of a destruction of cell body with escape of the granules.

In the subcortical white matter and especially in those layers immediately beneath the cortex these methods showed the most widespread changes. Alzheimer has given the name "füllkörperchen" to the queer mosaic-like bodies brought out in great numbers in proper materials by special methods. From his illustrations one receives the impression that these bodies are fairly sharply outlined. In the present instance not many such figures could be made out, for though the white matter is packed with abnormal materials they do not stand out as the sharply marginate angular mosaics which Alzheimer pictures. Instead of these the field is filled with very finely granular or almost homogeneous pale green material, bearing many fine fuchsinophile granules, wedging apart the nerve fibers and with or without visible association with a nucleus of the glia cell type. In most places they appeared merely as irregular masses lying in the tissues, though in sections which had fortunately passed through the proper plane their association

with nuclei was readily visible. Fig. 1, Plate II, shows two of these large ameboid glia cells with their nuclei and a third mass apparently not attached to either of the others. This third mass is the type of the material found so abundantly, and the writer considers it merely a protoplasmic extension either from one of the two cells illustrated or from an adjacent cell whose nucleus lies in a different plane. The lower of the two nucleated masses has surrounded a small capillary. In a few areas small groups of typical angular "füllkörperchen" were seen, but for the most part the filling material has the exact appearance of the bodies of the ameboid glia cells. The large bizarre ameba-like forms are found throughout the white matter but around the vessels are frequently seen forms containing inclusions of a greater variety. Fig. 2, Plate II, shows a large glia cell with its nucleus in its upper pole and its lower pole wrapped partly around a vessel. Near the vessel in the protoplasm may be seen a cluster of fuchsinophile granules while just below the nucleus are three small brown segmentally marked bodies to which the name "lipoid cystchen" has been given. These forms were few in number. Fig. 3, Plate II shows two ameboid glia cells about a small vessel. The smaller contains fuchsinophile granules while the larger shows a number of larger masses which have blackened with the osmic acid. Fig. 1 is from the white matter of the hippocampal gyrus. Fig. 2 is from the subcortical white matter of the anterior end of the second temporal gyrus. Fig. 3 is from the first frontal gyrus in the frontal field. Fig. 4 is from the first frontal gyrus on the frontal pole. The amount of material infiltrating between the fibers of the white matter is in many places tremendous and in all areas is large. The material from the hippocampal cortex (Sect. No. 28) gave the most intense reaction. Here were areas of subcortical white matter in which an oil immersion field would contain only three or four fibers, showing a normal appearance, while all the remainder of the field was made up of masses of the pale green protoplasm and fuchsinophile granules of the cell bodies of ameboid glia cells with an occasional nucleus. In those areas showing the lightest reaction possibly three-fourths of the normal fiber content remains but even here they are wedged apart by similar protoplasmic masses. The distribution throughout the cortex was rather irregular, as a reaction of marked intensity in one convolution even of the same field might be found to be contrasted with a very much lighter

reaction in a convolution immediately adjacent and of the same cortex type, so that no conclusion as to the distribution of the lesions could be drawn.

DISCUSSION OF FINDINGS.

From the clinical standpoint the diagnosis of the case is far from satisfactory in that the time of observation was so short and that the conditions of motor restlessness and mutism precluded much examination. The facts as given, however, would seem to warrant placing the case in the dementia præcox group—catatonic form. The death resulting after so short a course and without demonstrable anatomical changes places this case among those of most value for careful histological examination.

The chromatolysis so constant in the Betz cells is quite comparable to that occurring experimentally after extreme fatigue of the nerve cells. That this picture can be considered diagnostic of fatigue is, however, by no means so certain, as many acute disease conditions, *e. g.*, infectious delirium yield pictures of a very similar sort though as a rule more universal in distribution. Bearing in mind that the autopsy was performed 25 hours post mortem it would be hazardous to state emphatically that this change is an ante mortem one. However in reviewing the microscopic findings in the trunk one finds the post mortem changes to be rather small in amount and of minor grade. In the intestine there is evidence of disintegration of the superficial layers of the mucosa, but even here it is scarcely more marked than is occasionally seen in cases of slow disorganization and lingering death examined only a few hours post mortem. Again the kidney changes suggest disintegration in the condition of the cortical tubular epithelium. The pancreas which is one of the earliest indices of post mortem alteration shows it is true a certain amount of change, but it is by no means widespread or very advanced. The cultures show that there had been no widespread bacterial invasion by the easily grown saprophytes at least. On the whole the microscopic picture of the trunk organs shows a remarkably good state of preservation at this length of time after death. The cell changes are sharp and clear cut, the edges of the cells sharply marginate and the line of the nuclear membrane a distinct one giving a picture very different from the ordinary mussy fragmented appearance of post mortem changes. The type of staining reaction

seems to indicate loss chiefly of the stainable materials of both cell body and nucleus and in the more advanced stages in the nucleolus as well. This lack of staining power is in evidence not only by the thionin but by the hematoxylin in the Herxheimer method; the licht-grün by Alzheimer's Method VI, and the phosphomolybdic acid hematin Method IV. Again the granules of yellowish color described in the thionin stain speak rather for an active alteration than a passive destruction. These granules as has been mentioned above do not stain by the osmic acid or Sharlach R. methods (though their grouping is that of the basal clumps of lipoids) and take a darker stain than the surrounding protoplasm in the phosphomolybdic acid hematin and are not fuchsinophilic. In some particulars the change is similar to Nissl's Schwere zellerkrankung, but the nucleolus tends to hold its central position in the nucleus and does not sink to the bottom as Nissl describes. Again it is hard to explain why if the change is a post mortem one it should be so constant in the Betz cells while the giant cells of the postcentral cortex, morphologically and stratigraphically similar, are so comparatively free from change. Still more striking is the fact of severe change in certain cells with practically normal immediate neighbors. Considering all points the opinion seems justifiable that the change is not a post mortem one though as stated before an emphatic statement is not permissible. Similar cases in which less time has elapsed between the time of death and the time of autopsy may aid in explanation.

The Marchi preparations yielded nothing of note in regard to degenerated fiber sheaths though this method brings out well the accumulations of lipoid materials around the vessels.

The entire lack of fibrillar gliosis, as evidenced in sections stained by Mallory's phosphotungstic acid hematin after mordanting in ammonium bichromate and picric acid, reveals a lack of reaction on the part of the fibre forming glia elements which is rather to be expected in the course of the disease process in question.

In the Bielchowsky preparations the main variation was one of loss of fibrils and a negative picture in this stain does not carry much weight.

The evidence gained by the Herxheimer method is, however, of much more positive type. While it seems possible that fermentative activity might serve to produce Sharlach stainable lipoids by the breaking down of the normal lipoid materials of the central nerv-

ous system, yet their occurrence in the ganglion cells, glia cells and adventitial phagocytes certainly points to changes which were occurring during life. It is noticeable that the fat droplets in the protoplasm of the ganglion cells are very small and of a distribution different from the fatty changes noted in cells of senile and other long standing processes. The glia cells containing fat are all of the ameboid type or their close analogues and the contained droplets while fairly uniform are larger than those in the ganglion cells. In the phagocytes the droplets are large and close packed. The pictures as a whole suggest the explanation advanced by Merzbacher, Marchand, Held, Lugaro and others that these ameboid types are cells whose activity is directed toward collecting, elaborating and transporting products of degeneration of the nerve cells. The question as to whether these cells should be classed as neuroglial elements as held by the above-mentioned authors or are mesodermal elements need not be discussed here. The fact of their presence and activity leaves little doubt of the ante mortem existence of a widespread and acute disease condition.

The series of sections stained by Alzheimer's Methods IV and VI have yielded the most abundant evidence of alterations. The number of the cortical ameboid glia cells is not enormous though these cells alone bespeak an active process. In the subcortical white matter, however, the picture is that of an intense reaction on the part of these cells. The small number of *füllkörperchen* may possibly be explained on the ground of the acute stage of the process if Alzheimer's view that these bodies are products of the breaking down of ameboid glia cells be correct.

It must be remembered that findings of this type are of value only in such cases as terminate fatally *during the acute stage without serious concurrent physical ailments*. The presence of an associated septic process in the body beclouds the picture by the injection of another reasonable cause for such changes, while on the other hand all or at least the majority of the traces of alterations may have disappeared during the course of a chronic case. Alzheimer states this thus: "The ameboid glia cells are short lived and the pathological materials which they produce in the nerve tissues disappear in a proportionately shorter time than they themselves. When for example a storm of katatonic changes has swept through the cortex there is soon no more to be seen of the singular glia cells and pathological granules. So we find very

different pictures when we investigate acute and chronic stages of the same disease and meet on the other hand findings of broad likeness in very different diseases if they represent a similar intensity of the disease process."

RÉSUMÉ.

1. The case under examination is one of a psychosis of acute onset followed by death within 15 days and showing at autopsy neither gross nor microscopic visceral alterations of sufficient intensity to be regarded as factors in the disease or causes of death.

2. Clinically the diagnosis is not definite on account of the short time of observation and the condition of the patient but the limited data place it probably as a case of dementia præcox of the katatonic form.

3. Sections stained with thionin and by the Bielchowsky method yielded findings which might be the result of post mortem disintegration, but which in the case of the thionin specimens at least were probably ante mortem in occurrence.

4. In specimens stained by the Herxheimer and osmic acid methods considerable amounts of lipoid materials were found in the ganglion cells, glia cells and phagocyte cells of the perivascular spaces.

5. By Alzheimer's Methods IV and VI ameboid glia cells with a variety of granules are found widely scattered throughout the brain in the lower layers of the cortex and particularly in the subcortical white matter.

PLATE I.

Fig. A shows a Betz cell with a reduction in number and size of the tigroid bodies and faint staining reaction of its protoplasm, as contrasted with two smaller adjacent more normal cells. At its base is a neurophage with granules in the protoplasm.

Fig. B shows a Betz cell with no demonstrable tigroid masses showing loss also of chromatin from the nucleus.

Fig. C shows a Betz cell with no demonstrable tigroid masses showing a similar loss of nuclear chromatin and basal pigmentation. This cell also shows two neurophages and a number of nuclei of satellite cells.

Fig. D shows a Betz cell similar to Fig. C, but showing in addition marked shrinkage of the nucleus.

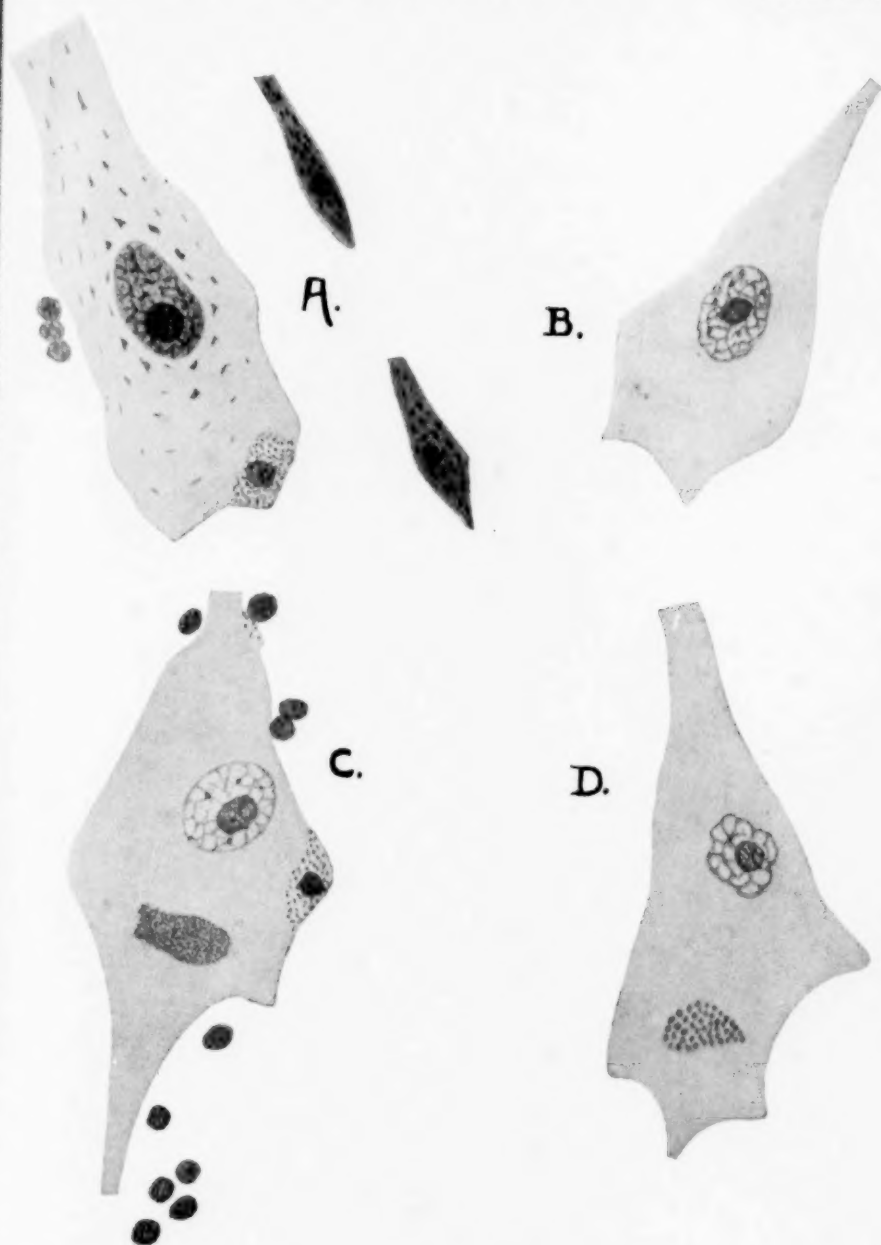


PLATE I.

PLATE II.

Figs. 1, 2, 3 and 4 are from osmic-acid-licht-grün-acid-fuchsin preparations.

Fig. 1 shows two ameboid glia cells with a portion of the protoplasm of a third from the subcortical white matter. The lower of the three surrounds a capillary.

Fig. 2 shows an ameboid glia cell with three "lipoid cystchen" and a cluster of fuchsinophile granules in close association with a capillary vessel.

Fig. 3 shows two ameboid glia cells, one containing fuchsinophile granules, the other containing large granules of lipoid material which have been blackened by osmic acid.

Fig. 4 shows a neurophage in apposition to a pyramidal cell which in turn shows degeneration of its nucleus and fuchsinophile granules of its apex. The neurophage also shows fuchsinophile granulations.

Fig. 5 is from Herxheimer preparations showing fine lipoid stippling of the protoplasm of the ganglion cells with large lipoid droplets in the body of a neurophage.

Fig. 6 shows a vessel with several fat-containing phagocytes in the perivascular spaces.

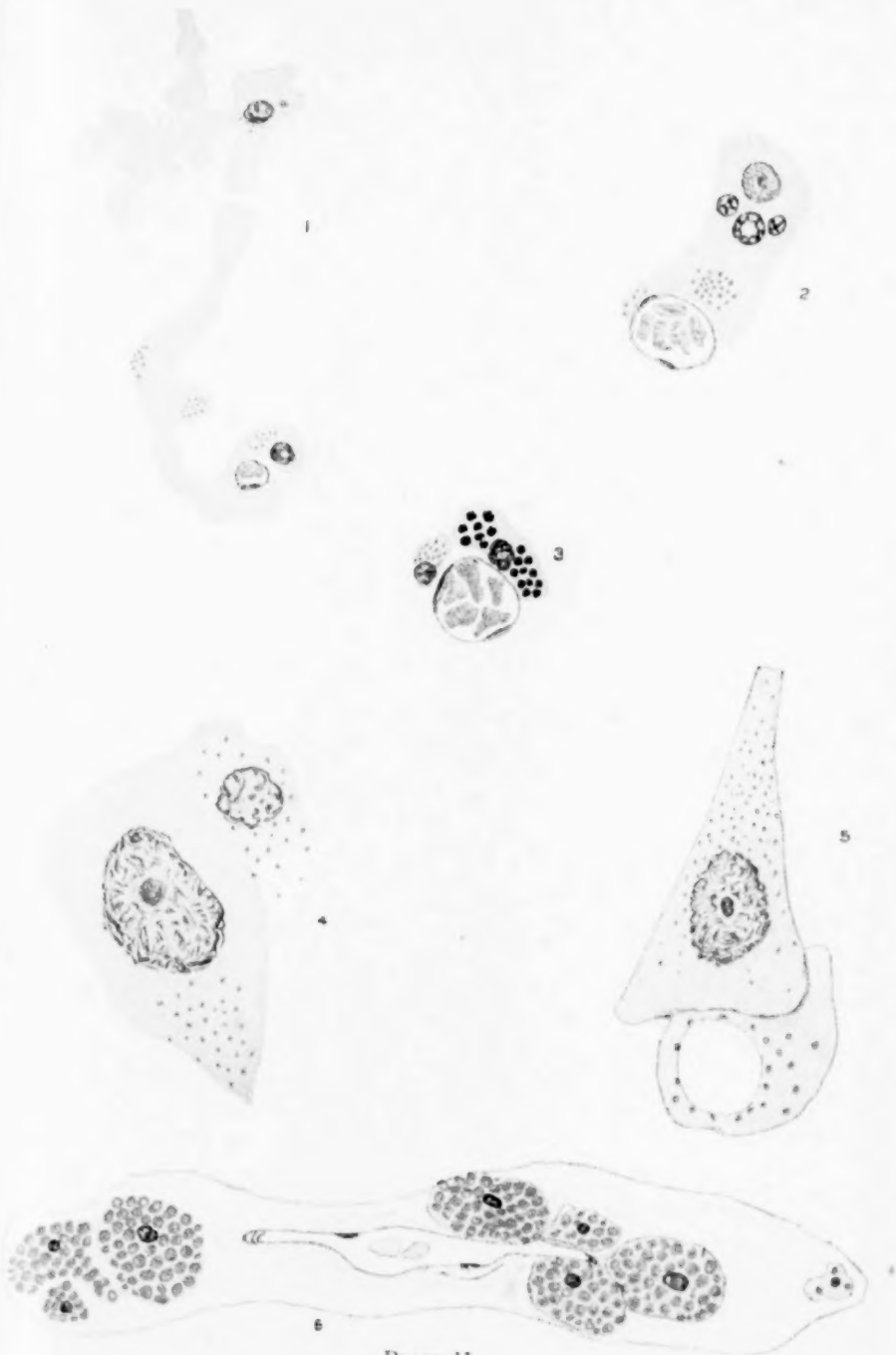


PLATE II.

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A SERIES OF NORMAL LOOKING BRAINS IN PSYCHOPATHIC SUBJECTS.*

By E. E. SOUTHARD, M. D.,

Pathologist to the State Board of Insanity, Massachusetts; Director of the Psychopathic Department of the Boston State Hospital; and Bullard Professor of Neuropathology, Harvard Medical School.

(From the Laboratory of the Worcester State Hospital, Worcester, Massachusetts.)

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When it was deemed wise to mark the end of an era at the Worcester State Hospital by the collection of certain papers illustrating both work going on at Worcester and work by former

* This paper forms contribution number eleven of the Worcester State Hospital (Mass.), Series of 1912, offered in compliment to Dr. Hosea Mason Quinby on the event of his retirement from the Superintendency after 20 years of service.

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Worcester-trained men, I felt a desire to contribute something, not on the score of Worcester training to which I can lay no claim, but rather in the line of illustrating the value of careful scientific records and routine as carried on in a great state institution for the insane. Latterly, as pathologist to the Massachusetts Board of Insanity, I had enjoyed a certain supervision over the scientific side of the institution in the hands of my friend and colleague, Dr. S. T. Orton, pathologist to the Worcester State Hospital, and had become familiar with his and prior records, including those of Professor Adolf Meyer. I, therefore, conceived it to be of interest to study, in a large series of data from a fresh source, unbiased by any presuppositions of my own, *the problem of normal brains in subjects of mental disease.*

II. THE PROBLEM OF NORMAL BRAINS IN MENTAL DISEASE.

The practice of psychiatry outruns theory in one respect. For the practice of psychiatry recognizes that at least some victims of mental disease have normal brains. Psychiatric theory, on the other hand, is prone to say, *insanity is brain disease*; for, even if normal to all appearance, the brains of insane subjects must contain somewhere some theoretically demonstrable sign of disease.

I grant that it is desirable to investigate the brains of insane subjects *as if* their neurones were diseased. I should assert, without fear of contradiction, that no human brain has yet been examined, whether of insane or other subjects, with such thoroughness as to permit the statement, *this brain is quite normal.* I am even of opinion that, especially on the receptive side of the apparatus, few brains have been studied thoroughly enough with available technical methods.

But it can only be the rational part to *consider brains normal until proved not so.*

In my study, since 1906, of Danvers State Hospital brain material, I have focussed all attention on the problem of normal brains in mental disease. It is, strictly speaking, not easy to find a normal brain at autopsy, at all events in insane hospitals. It is also, despite the negativity of routine reports, not easy to find a normal brain in general hospital material, and it is especially difficult in medicolegal material.

There, however, enters the person of the examiner. Few

general pathologists have had a thorough training in neuropathology, despite the fact that few other fields are so rich in recorded knowledge and in promise of knowledge. But a blind spot for the nervous system is cultivated by the pathologists, who proclaim their neurological ignorance with a pride almost fierce. Cornered they are prone to say that "so little definite is known," etc. All of which implies a complementary confidence in what is known concerning heart, liver, lung and kidney, which is astonishing. The result is that many brains dismissed as normal by the general pathologists prove abnormal on later review, anatomical or histological, and the impression has gained ground that *all* brains, at least of the insane, feeble-minded, or epileptic, will prove abnormal with the best technique.

In my personal series of autopsies, performed at the Danvers State Hospital, 1906-09, I was rarely able to find a normal brain according to my own standards of normality as demonstrable at the autopsy table. In a number of instances, however, extensive dissection proved requisite for the discovery of lesions, especially those affecting other regions than the cerebral cortex (*e. g.*, thalamus, dentate nucleus of cerebellum, etc.).

The abnormalities which I found, however, I could not feel were in all instances either causes or effects of mental disease. In several crucial examples I was able to prove microscopically a more extensive but milder lesion of perhaps a different locus than the naked-eye lesion. I, therefore, began to suspect that the gross lesions found were but promises of less severe (but perhaps more significant) lesions to be revealed by the microscope.

It is a fact that any severe cortical disease of fairly long standing is likely to be registered in the form of cortical induration or atrophy, diffuse or focal, of some degree. These scleroses, or the far more frequent atrophies, are perfectly possible of recognition by the interested pathologist and afford him significant guides in his microscopic research. It may conceivably happen that the focus of gross disease is no longer active and that the "symptom-producing" lesions are elsewhere and quite invisible to the naked eye. This latter state of affairs is perhaps not infrequent in dementia præcox (lower layer cortical gliosis) and in senile conditions (plaque-formation). In any event, however, the gross lesions which we find, whether active or extinct, are strong indi-

cators of what may be found and usually is found upon microscopic research.

Brains with gross lesions of a sclerotic or atrophic nature are at least *suspect*. We cannot divorce ourselves from the conception that the brains are in some respect *significantly* abnormal.

But what are *significant abnormalities* of the brain in mental disease? No man can confidently say. General paresis is commonly regarded as the paradigm of mental disease attended with gross lesions. Are the gross or microscopic lesions of general paresis significant abnormalities? For the present these lesions are far from explaining, with any close correlation, the particular symptoms or even the general course of general paresis. Nevertheless we are likely to believe that the lesions found are theoretically capable of explaining the symptoms.

There is one obvious but neglected feature of brain tissue reactions which helps in correlation. Let the brain disease surpass a certain limit, and destruction of cells will follow. As a result of this cell destruction, the reparative reaction of the interstitial tissues known as gliosis is virtually, with certain peculiar exceptions, certain to occur. When it occurs it is likely, as above stated, to register itself in the form of palpable induration.

But this process of induration and eventual atrophy is by no means instantaneous and probably as a rule requires many weeks to reach a degree capable of being felt with the fingers at autopsy. Consequently a number of serious brain-cell disorders will fail to be recognized by the anatomist, if the subjects have died within the early or pre-indurative period. The anatomist would perforce term such brains normal when the microscopist would readily find changes of a serious nature.

With this hasty review of the problems of gross neuropathological anatomy we can arrange a tentative *à priori* classification of the

Possible Groups of Normal-Looking Brains Found in Insane Subjects.

1. Cases of mistaken anatomical diagnosis (small and central lesions or mild diffuse induration and atrophy are frequently overlooked).
2. Cases of mistaken clinical diagnosis ("not insane" cases dying of somatic disease in the insane hospital because it would have been hazardous to remove them therefrom).

3. Cases of mental disease of a type which usually shows structural brain disease, but which have not survived long enough to show either induration or atrophy (cases of early or very mild general paresis may show *no gross lesions but characteristic microscopic lesions*, and cases with marked fatty changes in the brain may exhibit no gross lesions in the pre-indurative period).

4. Cases of mental disease, of a type which may be conceived to exist, exhibiting neither observationally nor theoretically any brain lesion either gross or microscopic.

It is the establishment of the existence of this fourth group of *intrinsically normal brains* that psychiatric science needs for the purpose of directing research economically.

Are there mental diseases such that the brains on investigation prove in all respects structurally normal as only abnormal in that they permit or purvey the abnormal symptoms? *Can brain structures be intrinsically normal while extrinsically abnormal?*

If so, it would become curiously necessary for pathology to busy itself with *proofs of normality* rather than with proofs of abnormality in a series of structures.

III. NORMAL BRAINS AT WORCESTER.

Of 249 cases autopsied at Worcester State Hospital, Massachusetts, in the years 1895-1911, without the *observation* by the pathologist at the autopsy table of *gross visible or palpable lesions of the cerebral cortex*, there were (to judge by the assigned clinical diagnoses):

Senile dementia	67
Senile melancholia	7
Senile dementia with alcoholism	2
Senile paranoia	2
Senile dementia with epilepsy	1
Senile delirium	1

—
Total senile psychoses

Epileptic dementia	2
Organic dementia	1
Secondary dementia	1
Terminal dementia	1
General paresis	1

—
Total organic and other dementias, except dementia
præcox and alcoholic psychoses..... 6

Manic depressive insanity	27
Melancholia	10
Involution-melancholia	8
Involution-psychoses	2
Circular insanity	2
Anxiety psychosis	1
Stuporous melancholia	1
Agitated melancholia	1
Hypochondriacal melancholia	1
—	—
Total manic-depressive group	53
Dementia præcox	42
Paranoic conditions	14
Essential dementia	1
—	—
Total dementia præcox group	57
Alcoholic insanity	5
Alcoholic delirium	4
Alcoholic deterioration	3
Alcoholic hallucinosis	2
Alcoholic mania	1
Delirium tremens	1
—	—
Total alcoholic psychoses	16
Epileptic insanity	5
Epilepsy	4
Imbecility	4
Idiocy	2
Imbecility and epilepsy	1
—	—
Total epileptics (non-senile) and imbeciles	16
Acute delirium	6
Toxic delirium	3
Delirium	2
—	—
Total non-alcoholic deliria	11
Constitutional inferiority	3
Hysteroid insanity	1
Huntington's chorea	3
—	—
Total	7

The separate larger groups might therefore be classified as follows, having in mind a general adherence to Kraepelinian lines:

Senile group	80
Manic-depressive group (melancholia included).....	53
Dementia præcox group	57
Alcoholic group	16
Epileptic and imbecile group	16
Deliria, non-alcoholic	11
Miscellanea (hysterical insanity, Huntington's chorea, constitutional inferiority)	7
Organic dementia	6
Unrecorded	3
Total	249

GROUPS OF DEATHS IN QUARTER-CENTURIES.

	Cases
First quarter-century (actually 16-25).....	18
Second	68
Third	120
Fourth (actually 76-91)	42

That there should be a group of 42 cases dying insane at ages between 76 and 91 and exhibiting intact brains on the autopsy table presents a significant problem. Many pathologists would wonder whether the brains of normal seniles should not exhibit some traces of atrophy, at all events in the higher eighties. And it would be only natural to suppose that the wear and tear of brains in the insane should lead to still greater atrophic changes.

Let us examine the assigned diagnoses in this *senile group* of subjects insane but intact of brain:

DEATHS OF INSANE WITH INTACT BRAINS, <i>ÆT.</i> 76-91.....	42
Senile dementia	32
Paranoic conditions	3
Alcoholic conditions	2
Imbecility	1
Essential dementia	1
Manic-depressive insanity	1
Epileptic insanity	1
Delirium	1
Other diagnoses	10

Compare this with:

Deaths of insane with intact brains, <i>æt.</i> 71-75.....	22
Senile dementia	7
Other diagnoses	15

Either there is a crisis at which the psychosis senile dementia begins to be very frequent (consistently with intact brains), somewhere about the 75th year of life, or else the *diagnosis* senile dementia begins to be made with greater frequency about this crisis.

Comparing the incidence in the two hemidecades adjacent to this crisis, we find:

7 senile dements in 22 subjects æt. 71-75
19 senile dements in 27 subjects æt. 76-80

Before dismissing the problem of normal brains in senile psychoses, it is important to consider brain weights in the series, since the difficulties of naked-eye diagnosis do not always permit a ready evaluation of brain atrophy.

	Average.
Senile psychoses, <i>male</i>	49
Brain weights above "average" (1357) ¹	1289
Brain weights below "average" (1357)	1435
Brain weights above 1265 ÷	37
Brain weights below 1265	28
Brain weights below 1265	21
Senile psychoses, <i>female</i>	25
Brain weights above "average" (1235)	1124
Brain weights below "average" (1235)	4
Brain weights below "average" (1235)	1318
Brain weights above 1112 *	14
Brain weights below 1112	11

It is generally thought that the "averages," 1357 for male brain, 1265 for female brain, are too low, particularly in view of the fact that at least one of the component series of Vierordt's table, viz., Weisbach, 1866, includes brains with membranes removed. Accordingly it seems to be true that these cases exhibit weights too often below the "average," since almost any series of brains from general hospital material will show many cases with brains above Vierordt's "averages."

But there is stated to be a loss in brain weight varying with age. I have, therefore, tabulated these cases of senile psychoses, in

* Lowest averages assigned to Europeans (pia mater removed), Weisbach, see above.

accordance with the *probable* brain weights for their ages (Vierordt's combined tables), following a principle first adopted in some work done with Dr. Newell B. Burns at Danvers State Hospital.²

By this method, calculating all brains having below 98 per cent of the probable weight as of subnormal weight, I find that 40 out of 73 cases with brain weights available show brains with less than 98 per cent of their probable weights according to age.

Adopting another arbitrary standard, once in vogue, I found four cases having weights a sixth or more less than their probable weights.

7.2, F., 62.....	$\frac{995}{1210}$	= .82	(percentage of prob. wt.)				
9.54, F., 71.....	$\frac{970}{1170}$	= .83		"	"	"	"
9.83, M., 76.....	$\frac{1010}{1290}$	= .78		"	"	"	"
10.60, F., 68.....	$\frac{890}{1210}$	= .74		"	"	"	"

It may well be that these four cases should not belong in a group of "normal-looking" brains on the score of brain weight. Or we may possibly be dealing with a degree of microcephaly. In either case we should not be safe in considering these cases normal. If normal they must represent a deviation so extreme as to cause remark.

But six other cases show brain weights deviating more than 10 per cent from the average.

One of these,

$$7.53, M., 73..... \frac{1095}{1290} = .85,$$

may belong with the extremely low weight series, but the others all belong within a range of 12 per cent of the average and are more likely to belong accordingly among the "normal," *i. e.*, not too extreme, deviates.

My general conclusion here is that four or five cases whose brains looked "normal" to the anatomist were with a certain probability abnormal (whether morbid or merely anomalous should not be risked). I remain with the impression that gross pathological anatomy has still to prove that *senile dementia*, as

we use the term, is attended with any considerable loss of brain substance in a large group of instances.³

	Total.	Abnormal.	Normal-looking.
Worcester series	741	492	249
Senile psychoses	176 24 %	96 20%	80 32%
Manic-depressive insanity	36 4.3%	9	27 10%
Dementia præcox	42 5.6%		42 17%

These figures betray the curious fact that there is a higher percentage of senile psychoses in the normal-brain series (32 per cent) than in the abnormal-brain series (20 per cent). Another fact of interest (though here the figures are small) is that some of the manic-depressive brains seem to have been injured so as to show gross lesions but none of the dementia præcox brains.

Next to the problem of normal brains in the senile psychoses may be set the problem of normal brains in dementia præcox. The apparent normality of the brain in dementia præcox, or, to be more exact, the lack of startling gross alterations in dementia præcox brains, has led many persons to the conception that dementia præcox is a "functional" disease, either in the sense that no structural changes *have been* found in these brains or in the sense that none *will be* found therein.

We have seen that on this ground a huge proportion of senile dementias and other psychoses could be dubbed "functional" and in part perhaps properly so termed. We have also seen that the manic-depressive group is not at all free from a large proportion of cases with brain lesions (at least at time of autopsy), so that with equal propriety it might be argued that manic-depressive insanity is *not* a functional disease.

How then shall the apparent normality of 42 brains in dementia præcox be explained?

In one case (xv, 74) my colleague, Dr. Orton, was able to resolve the question satisfactorily by showing that the case was one of "brain death" (*Hirntod*) in Alzheimer's sense; in short, that the case, though possessed of an *anatomically normal* brain had a *histologically quite abnormal* brain. This case is to be published elsewhere.

The above case (xv, 74) had symptoms of but 15 days duration. Upon the general principle hinted at above (in the paragraph concerning the importance of gliosis), we should not expect *gross*

anatomical evidence of disease in a case having such a brief total duration.

As a matter of fact 20 additional cases, *i. e.*, 21 cases or 50 per cent of the dementia præcox series, were cases having an assigned duration of less than two years.

The other 50 per cent of the dementia præcox group represent cases of, as a rule, much longer duration. In fact if we omit one case with assigned onset at 42 and death at 45 (xv, 50), very possibly a case of involutional character and another case, presumably of hebephrenic type with onset at 18 and death at 23, there are no cases with duration less than eight years. There appear, then, to be two groups of cases of dementia præcox, one group with durations of less than two years and another with durations as a rule eight or more years—a group of cases with small viability and a group having greater viability. Such a distribution may well indicate a somewhat critical character to dementia præcox, a tendency to a partition of cases into those in which the organism tends to go to pieces early and those of a more durable character. Incidentally it may be remarked that of 13 cases of katatonic type, but four belong in the “durable” group. Such a distribution, should it be confirmed by larger figures, might well emphasize that which perhaps goes without saying, *viz.*, that katatonic cases are still more critical than others of the group.

When we compare this distribution in the dementia præcox group with that for the whole group of “normal-looking” brains, we find:

	Cases of less than 2 yrs. duration.	Cases of 2-8 yrs.	Cases of more than 8 yrs.
Dementia præcox	21	1 (2?)	20 (19?)
Whole group	85	81	82

It would be very desirable for all workers having access to extensive series of dementia præcox cases to study them from the point of view of *duration*.

Dismissing these incidental problems for the time being, it will be well to state what interpretation can be given to the “normality” of the brains in this series of dementia præcox brains.

In the first place half of them are cases of comparatively brief duration and may not have lasted long enough to change appreciably the size, shape, or consistency of the brain.

In the second place the analysis of these cases was not made with the knowledge of what was to be proclaimed so forcibly in later years, viz., that *dementia præcox is an organic disease*.

It will be remembered that some 86 per cent of the Danvers autopsy series of dementia præcox cases, viz., 24 out of 28 cases, were thought to possess structural lesions, either gross or microscopic.*

The disparity between the Worcester group and the Danvers group is at first sight striking; but it must also be remembered that, whereas 249/740 of the Worcester cases of mental disease (all types) showed normal-looking brains, only about 0.3 of the Danvers series could be safely put into that group. It is obvious, therefore, that different anatomical standards prevailed in the two laboratories. And it is especially valuable to have this statistical evidence of the degree of separation of these standards.

The question of duration is so important in the evaluation of the effect which a given disease may exert upon the brain that the whole distribution is presented, so far as it concerns 248 cases.

Duration.	Cases.	Duration.	Cases.
3-12 months	26	21 years	1
3-12 months	10	22 "	3
1- 2 years	49	23 "	1
2- 3 years	26	24 "	3
3 years	21	25 "	1
4 "	6	27 "	2
5 "	9	28 "	2
6 "	10	30 "	1
7 "	5	31 "	2
8 "	4	32 "	3
9 "	8	33 "	1
10 "	4	36 "	1
11 "	2	37 "	2
12 "	7	38 "	1
13 "	4	40 "	1
15 "	7	42 "	2
16 "	6	43 "	2
17 "	1	47 "	1
18 "	3	50 "	2
19 "	3	52 "	1
20 "	1	53 "	1
		55 "	1
		78 "	1

IV. COMPARISONS OF THE WORCESTER AND DANVERS SERIES OF AUTOPSIES.

The Worcester State Hospital series of autopsies in cases of mental disease, 1895-1911, numbered 740. The brains of 249 of these subjects, or about *one brain in three*, are recorded as of normal appearance on the autopsy table. A somewhat larger Danvers State Hospital series, similarly studied, had yielded something like *one brain in four* as of normal appearance in the gross.

As these *normal-looking brains* stand the best chance of corresponding with the so-called *functional* cases of *mental disease*, some effort has been spent on classifying the group from certain view-points, particularly those afforded by previous studies in the Danvers series.

Brains should perhaps be considered normal until proved abnormal, even if they belong to the subjects of mental disease. A review of the possible groups of normal-looking brains found in insane subjects leads to the supposition that there may be a certain group of such which will fail to show any lesion whatever: *there may theoretically, perhaps, exist brain-structures which, whereas intrinsically normal, are extrinsically abnormal.*

Before we arrive at a proof that such *intrinsically normal* brains can be found in psychopathic subjects, however, we must very carefully scrutinize our data.

It is well-nigh incredible that (as shown by the Worcester series) there is actually a higher percentage of senile psychoses in the normal-brain series, viz., 32 per cent, than in the abnormal-brain series, viz., 20 per cent. But a Danvers study had already shown the great variety of conditions covered even by the term senile dementia and had indicated that about one in every three so-called senile demented had a normal-looking brain. It would seem, then, that many of the senile psychoses, including a fraction of the dementias, are either functional diseases (in which the brain is intrinsically normal) or else based upon fine changes or limited changes not registered in the gross brain. The modern study of cortical "plaques" suggests a solution for at least part of this problem. In any case the facile pens which underwrite "arteriosclerosis" as a cause for everything must surely turn in some other direction.

Of course more finical search for lesions, such as diffuse or

focal atrophies and indurations and various concealed lesions, might conceivably have altered these statistics by lowering the number of normal-looking brains. But the standard of normality also depends on the fear of attributing too great significance to minor anomalies or aplasias of the brain convolutions. To save the particular case from misinterpretation and overloading the slight apparent anomaly or lesion with too great functional consequence, the anatomist, however, is likely to throw into the normal-brain group various cases that look strange there. The general trend of psychiatry now demands proofs of normality in any brain of a psychopathic subject.

A less inevitable frailty of diagnosis is shown by these statistics in that patients over 75 years of age at onset are *far* more apt to receive the diagnosis senile dementia than those just under 75 years of age. After 75 the diagnosis senile dementia is surely too facile.

Another odd fact (at least in the writer's view, who had supposed manic-depressive insanity might prove exceedingly "functional" and to have brains only *extrinsically abnormal*) is the fact that one in four of the manic-depressive brains was in some respect grossly abnormal, whereas none of the 42 brains in dementia præcox exhibited gross abnormality. The latter finding is widely discrepant from Danvers findings in a similar series (where some 68 per cent of the series was thought to show gross cortex lesions and even 86 per cent to show gross or *microscopic* lesions).

The Worcester dementia præcox findings are perhaps in part explicable by the prevalent standard of anatomical diagnosis, anxious to avoid magnifying the importance of small atrophies or anomalies. It is also interesting to note that fully half the cases of dementia præcox autopsied at Worcester were of comparatively brief total duration (less and often far less than two years). Moreover nine out of the thirteen katatonic cases were in this brief-duration group: if the Danvers suspicion that the lesions of katatonia tend to be post-Rolandic is a well-founded suspicion, then another reason for missing the lesions can be adduced. In the writer's experience atrophic lesions of the posterior association area are most often missed, and similar lesions of the anterior association area most often neglected because so common.

The fact that these cases of dementia præcox are almost equally divided into a group with deaths two years or less from onset and a group with deaths eight or more years from onset suggests an inquiry to determine whether there may be two biological groups of these cases (the total series of all sorts of mental disease fails to show such a division).

Should this curious distribution of durations in the dementia præcox series be confirmed from other quarters it might prove possible to distinguish a *dementia præcox brevis* from a *dementia præcox longa* on grounds of differing natural history.

CONCLUSIONS.

1. The main object of this communication is to stimulate interest in normal or normal-looking brains in psychopathic subjects, so that the question whether insanity is, or is not, always a matter of structural brain-disease may approach settlement.

2. Normal-looking brains have now been found in a large fraction of senile dementia cases in two autopsy series, so that the "functionality" of these cases stands on as good a footing as that of various more generally recognized "diseases of mental function."

3. The issue in dementia præcox is now clearly defined, since one series (Worcester) might be interpreted to affirm the functionality, and the other (Danvers), to affirm the structurality ("organic nature") of the disease in question.

4. Incidentally the question has arisen whether dementia præcox may not on the ground of viability be divided into *dementia præcox brevis* (with early death, say under two years from onset; katatonic form often here found) and *dementia præcox longa* (in which the subject dies, as a rule more than eight years after onset, of a variety of causes; katatonic form less frequent).

5. Use has been made of a principle that apparent normality of brains may be consistent with fine microscopic changes, possibly of a reversible nature, and that we shall hardly from gross appearances be able to assert abnormality of brains unless at least three months (pre-indurative period) have elapsed from the onset of some cell-destructive process.

6. Use has been made of a principle to the effect that various nerve cells which are in all respects intrinsically normal may be essentially sharing in processes extrinsically abnormal.

7. The hypothesis is raised that the whole cortex, or even the whole nervous system, might be intrinsically normal but extrinsically abnormal in its reactions to a given chemical, physical or other condition.

8. It is possible that the solution of the problem of the functionality of various diseases might be to consider the structures involved as intrinsically normal whereas extrinsically abnormal—the normal operation of various cells leading to injurious effects in the organism as a whole.

9. It seems clear that the general statement "*insanity is brain-disease*" is well-nigh meaningless unless the particular structures thought to be involved are specified, since it is clear that science has not discovered even the right place to look in certain diseases (no more in mental disease than in certain forms of, say, diabetes).

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REPORT OF A CASE OF A LARGE ENDOTHELIOMA OF THE FRONTAL REGION OF THE BRAIN,

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The case here reported is that of an intracranial tumor, an endothelioma, involving the frontal region of the cerebrum. Three factors, two general in their application, one specific, are of interest in connection with this report. First: Of the commoner types of intracranial growths, endotheliomata appear to be less frequent than other varieties. Second: The possible long duration of the lesion in the present instance. Third: Although the clinical symptoms in this case correspond in many respects with the observations made of frontal tumor, in a large hospital where mental diseases predominate and where thorough routine neurological examination in all cases is precluded, there is great liability of similar cases being mistaken for general paralysis.

Of 16 or 17 different pathological varieties of intracranial growths mentioned in the literature, gliomata appear to be the most frequent. In a recent review of 500 cases of intracranial tumors, Tooth finds that as compared with gliomata, endotheliomata are much less common and that the latter occur practically only in the anterior fossæ of the skull and he observes that it is "curious and interesting point, and it is difficult to explain why the endothelium of the falx and only the anterior part of it should be affected to the exclusion almost of all the rest of the great dura matral sheath." Blackburn and Hough on the other hand found, in 29 intracranial tumors studied, 17 endotheliomata which they believe are probably derived from the lymph spaces of the dura.

As to the possible long duration of the new growth in the present case there are no substantiating facts, but it is to be noted in the anamnesis that 15 years ago the patient suffered a nervous breakdown from which he never fully recovered and was of sufficient severity to cause him to retire from active professional

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work and lead a purposeless, inactive life. Ten years later we find the patient having attacks of lethargy with some affect of depression. The acute symptoms we note presented a rather abrupt onset and were of only four months duration.

A review of a portion of the literature relating to frontal tumors leads one to depend not so much upon the neurological symptoms in localizing the growth as to be guided by the psychic manifestations. There appears to be considerable weight placed on the mental disturbances caused by frontal tumors, more especially the occurrence of apathy, lethargy, somnolence and progressive mental deterioration. Oppenheim remarks that "in those cases in which mental defect, apathy, stupor or some well-defined psychosis has constituted a striking symptom, the suspicion of frontal tumor may be entertained." Gowers has stated "in cases where there is pronounced mental disturbance . . . or actual dementia, the tumor is generally in the anterior portion of the frontal lobe." Schuster in his exhaustive monograph on the "Psychical Symptoms of Brain Tumor" found 12.1 per cent of the tumors to be in the frontal lobes. Dercum in his report of a "Tumor of the Frontal Lobes with symptoms of General Paralysis" makes reference to progressive mental deterioration, indifference and apathy, while C. K. Mills remarks, "It is well known that psychic symptoms have often been observed in frontal, and especially, prefrontal tumors. Finally Knapp reports that five of six cases of frontal tumor studied by him showed simple mental failure with marked dullness. These observations accord with the findings in the present case, moreover the symptoms which in any manner indicated cerebral irritation were late in appearance and were not unlike those occurring in the terminal stages of general paralysis.

CLINICAL HISTORY.

The patient, a male aged 45; married; was born in St. Louis, Mo., of Bohemian parentage. Little is known of his family history or of his early life other than that when a boy he learned to play a violin under his father's and professional instruction. At 14 he became leader of an orchestra and until 1897, when he was 30 years old, continued as such. It is stated that the patient was especially proficient in original composition and transposition,

quick at reading and memorized much. In natural disposition he was retiring, made few intimate friendships, but was not unsocial. In his habits he drank liquor to moderate excess and used tobacco. There is no history of specific disease. He is said to have had no serious illnesses nor injuries. A nasal polyp was removed when he was nine years old. In 1897 following a period of hard work conducting an orchestra by day and composing music by night he "broke down" and after an attempt to resume he gave up his professional career and retired to a small town where he worked as a painter of metallic goods. He frequently complained of indigestion which he attributed to the odor and taste of paint. In 1908 he had an attack of abdominal colic and diarrhoea followed by a severe furunculosis of the buttocks.

The onset of the final sickness apparently dates from December, 1910, although for the past 15 years and more especially the past 5 years, the patient has frequently felt indisposed, lethargic and stated that his "nerves did not feel right." In December, 1910, he gave up work, remained at home, became logy, lacked energy and was reluctant to move about; he seemed blue and dissatisfied, complained of having no work although he could have secured it if he had sought it. In February, 1911, while walking on the street he suddenly fell, was removed to an office where he remained unconscious a short time. No sequelæ were noted and in May, 1911, his general health had so far improved that he resumed work which he had relinquished in December, 1910. In the middle of September, 1911, the patient again became inactive, lethargic, slow of movement, inclined to remain abed until late in the morning, requiring prompting to go to the mill both before and after breakfast and at the noon hour. On October 5, 1911, his inactive, dull condition became so aggravated and his being unable to perform a satisfactory day's work (noted by his employer) he remained at home. On the following day he was sent to the grocery but having been gone so long his wife went on the errand and learned that the patient had not been to the store. Upon her return home she found the patient lying upon the floor at the foot of the stairway down which he had evidently fallen. He was assisted to bed where he remained for a day. Total amnesia for these events prevailed. Shortly after this it was noted that the patient's face was expressionless, his

speech slow, hesitating and delayed. His left arm was so weak that he required assistance in dressing and he was no longer able to hold his violin in position. Two weeks later a left foot drag was noted. At this time mental torpor, forgetfulness and apathy supervened. He made errors in dressing himself and while giving violin lessons he would lapse into dull forgetful conditions, so that what was formerly a half-hour lesson now required two or three hours. It is worthy of notice, however, that to the last of his playing the violin, which was only a few days before he was sent to the hospital, the patient was accurate in tone perception and reading, but slow in execution, lacking in expression and very forgetful. In writing he lacked spontaneity, but at dictation he comprehended, wrote and spelled correctly.

Since October 5, 1911, the patient had four or five attacks of vertigo during which he fell to the left with attempts to save himself and these attacks were not associated with unconsciousness. Mentally the deterioration was progressive, lethargy being pronounced, disorientation for time, sloven table habits, insomnia with restlessness accompanying features. Shortly before his admission to the hospital the patient presented symptoms of apraxia and an unconscious loss of control of sphincters became a troublesome feature. Throughout the course of the disease, hallucinations, headache, vomiting or cephalic tenderness were never observed.

Upon admission to the hospital, December 16, 1911, the patient appeared demented, very indifferent and inactive. He walked unsteadily and in the ward he remained quietly in bed which he soiled shortly after taking the customary bath. The physical examination revealed an expressionless countenance. Skin, mucous membranes and fauces normal. Moderate muscular development of good tonus. No glandular enlargement. A systolic mitral and a presystolic aortic murmur were heard in the cardiac region. The respiratory and alimentary systems negative. The neuro-muscular examination showed the left side of the face to be lower and flatter than the right. Tongue protruded promptly with fibrillary tremor and deviated to the right. Lips retracted equally well on both sides with fine tremor. Pupils unequal, the left being slightly larger, but both reacted well to light and accommodation. Cutaneous reflexes normal. Deep reflexes active

and equal. No Babinski's sign nor ankle clonus. Gait and Rhomberg position showed marked unsteadiness. A significant, indeed the only subjective, symptom offered was the ever present odor and taste of paint. The only sensory disturbance was that of sight, as the patient was unable to read newspaper print without the aid of glasses. The emotional attitude was one of marked apathy and indifference. There was no disturbance in comprehension nor attention, although the latter lapsed quickly. Orientation, recent and remote memory and grasp upon surroundings showed impairment. There was marked poverty of thought and general lack of psycho-motor activity. There was no delusion formation and hallucinations were not elicited.

In the early part of January, 1912, it was noted that the patient was very somnolent, so much so that during short interviews he lapsed to sleep. At this time his speech was quite tremulous, but other physical changes were not obtained. On February 19, 1912, while asleep the patient made a slight outcry which was followed by a tonic and clonic convulsion, the head and eyes being fixed to the left, the eyes turned consensually upward and outward. The right pupil was larger than the left and both reacted sluggishly to light. Double ankle clonus, more active on the left, double Babinski's sign, more active on the right, was observed. From this date until death the patient remained unconscious. During four hours he had seven convulsions which involved the left facial muscles, left arm and leg. Following lumbar puncture the convulsions ceased for 10 hours when slight left sided convulsions recurred frequently. The patient became progressively weaker, hiccough being an added complication and he died on the second day after the onset of the convulsions.

AUTOPSY.

The visceral examination revealed calcification with plaques of thickening throughout the length of the aorta, thickening of aortic and mitral valves and lesions of broncho-pneumonia in the lungs.

The calvarium was found to be rather thin and rather soft, the internal table being especially thin. Diploe rather marked in amount and widely distributed. Dura taut and thin, slightly opaque. On stripping back the dura it was found to be adherent along the mid-line to the posterior end of a roughly quadrilateral

space about 4 cm. in width by 8 cm. in length which lay along the longitudinal sulcus and appeared as a distinctly different type of tissue than the adjacent brain substance. It was grayish pink in color and apparently made up of strand-like accumulations of tissue. The point of adhesion to the dura occupied a space approximately 1.5 cm. in circumference. The brain weighed 1560 gms. Pia thin and translucent. Pial vessels engorged with blood. Convolutions firm and everywhere flattened. Under the tumor mass mentioned in the description of the meninges the consistency was much harder, otherwise there was very little variation from the normal. The majority of the tumor mass was apparently situated to the right of the median line and had pushed over the right first frontal convolution so that the gyrus formed a large curved detour around the more or less quadrilateral tumor mass. The tumor apparently was divided in the mid-line and a smaller mass projected into the first frontal gyrus of the left side, although this gyrus was not displaced laterally so much as on the right side, but its mesial surface was markedly atrophic and reached the dome as a narrow knife-edge of cortex overlapping the edge of that portion of the tumor. Sections showed that the tumor was roughly ovoid in shape, beginning well up in the frontal pole within 1 or 2 cm. of the pole itself, and extending back for a distance of approximately 12 cm. The greatest diameter was about midway of this distance where it was approximately 8 cm. in width. Below it reached almost to the orbital plate and was separated from it by only a narrow remnant of the former orbital convolutions. In this position the two halves of the tumor mass were united. Higher up they separate along the line of the great longitudinal fissure, the larger mass lying in the right hemisphere and the smaller running into the left hemisphere near the longitudinal fissure. It was apparent that the tumor had pushed back the structures of the right half of the brain so that sections cut transversely across the brain showed that the temporal pole on the right was a trifle farther back than on the left, that the optic thalamus was definitely farther back, that the internal capsule with its associated ganglion structures and the anterior end of the corpus callosum, and the anterior end of the right lateral ventricle were all more dorsally placed on the right than on the left. Apparently this displacement took place without

great loss of substance. The tumor mass itself was loosely encapsulated and it was the capsular surface which gave to it the strand-like appearance described under the meninges. The tumor showed as a fairly solid flesh pink mass with numerous small hæmorrhagic foci. There were, however, no foci of softening other than those associated with hemorrhage. The capsule where the tumor reached the pial surface was fairly definite and where it came in relation with brain substance there was less demarcation, yet the tumor did not appear to infiltrate the brain substance except possibly to a slight amount on the lower surface in the frontal fields. That portion of the tumor which was adherent to the dura was apparently a semi-detached mass lying above cortical structures and entirely separated dorsally from the remainder of the tumor, but confluent toward its anterior end. Those portions of the cortex affected by the immediate pressure of the tumor all lay in the frontal, prefrontal and intermediate precentral fields. Apparently the tumor did not extend as far back as the precentral fields, although the mass attached to the dura rested apparently on the gyrus immediately in front of the precentral. The white matter adjacent to the tumor mass showed a condition of softening which was definitely palpable. The orbital plate of the sphenoid and frontal bones and the orbital fat pads were so thin that the bone appeared as a thin sheet which could be broken with the pressure of a finger.

MICROSCOPIC EXAMINATION.

The microscopic examination of the trunk organs added nothing of interest.

The microscopic examination of the brain in those parts not immediately adjacent to the tumor showed dilatation and engorgement of vessels of all calibers in both meninges and the brain substance itself, the larger vessels showing a definite thickening of the adventitia. Where the larger meningeal vessels lay, they deeply indented the cortex. The pia was everywhere thickened, but in variable degrees. The nerve cells except in areas where pressure was marked were apparently in normal condition. There was an increase of satellite cells in the deeper laminæ. While there was no neuroglial increase in the substance of the cortex, there was everywhere evidence of increase at the

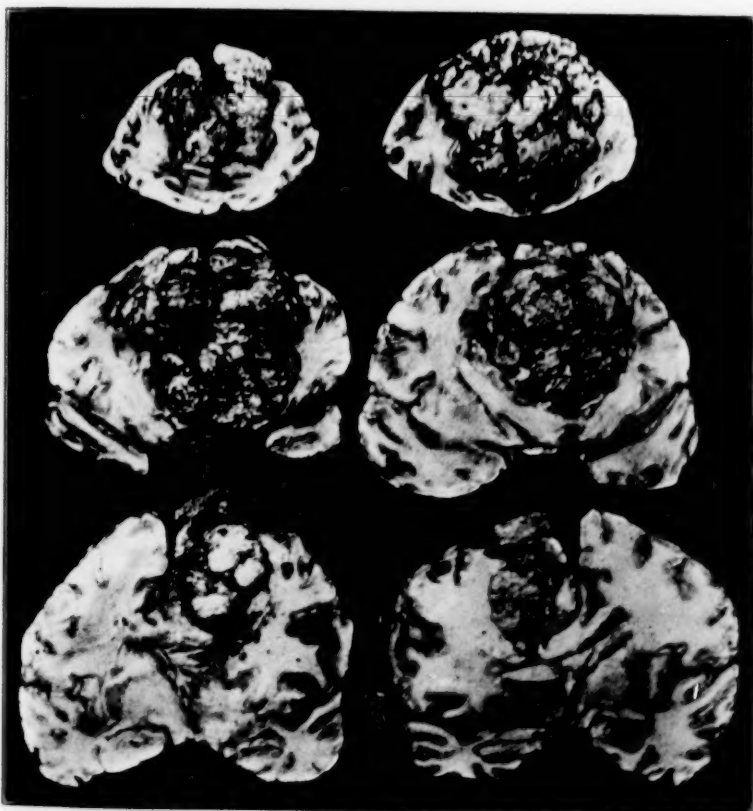
surface of the zonal layer. As in the case of the nerve cells, the nerve fibers were apparently unaffected, except in those local areas where pressure had been most marked.

The examination of the areas immediately adjacent to the tumor here revealed the vascular changes as mentioned above, but in greater degree. The pia, in addition to the general thickening, presented foci of marked increase of cells of a type resembling those of the tumor. The nerve cells presented interesting features dependent upon the direction of the tumor pressure. Where the pressure was apparently lateral the cells were narrowed and relatively elongated. In other instances, where there had apparently been compression from above, the basal portions of the nerve cells were broadened, while the apical portions were shortened, or the basal processes had practically disappeared. The cells were fairly well stained, but the tigroid bodies appeared as small granules. The nuclei were small, pale and for the most part central. Here and there, in areas where there was sharp curving of the cortex, the cells appeared to be compressed laterally. In general, where the compression was greatest, the cells beneath the summits of the convolutions appeared compressed and narrowed, while the compression of the adjacent convolutions gave rise to distortion not only of the normal vertical arrangement of the cells, but also to distortion of the lamination as well into unusual planes, even circular-like figures. The cortex showed a good content of fibers of all sizes except that in the summits of those convolutions which suffered most from compression were more sparsely supplied than adjacent parts. Here, however, there were numerous well-stained fibers, the brunt of the loss falling upon the coarse varicose type while the finer fibrils suffered less.

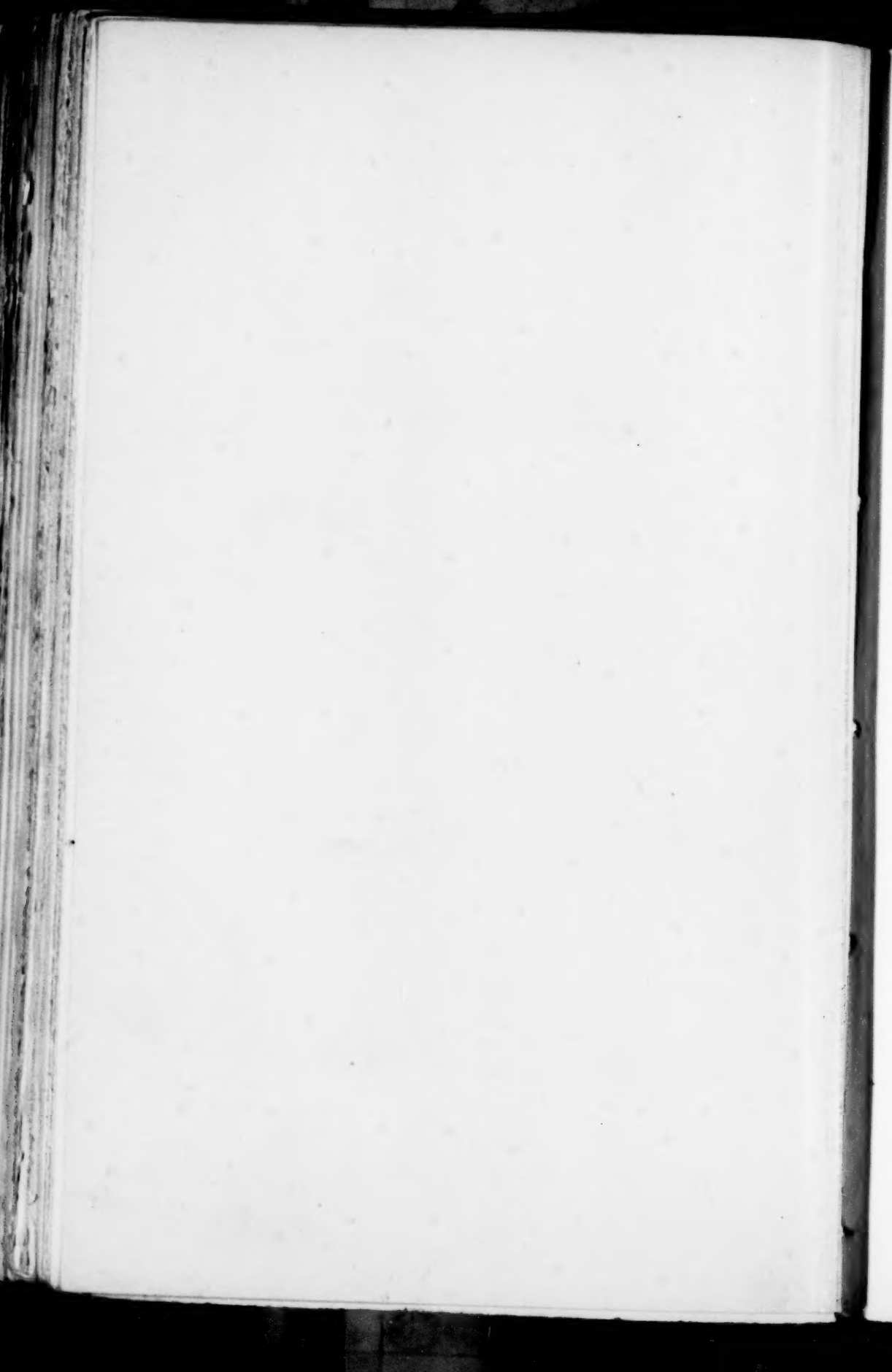
The tumor was made up for the most part of cells with large vesicular nuclei and large masses of protoplasm. The cells in most places were irregularly polyhedral in shape in some areas stretched out in cylindrical or spindle shapes. The nuclei varied markedly in size in different parts of the tumor. Some small, containing a considerable portion of chromatin granules, others larger and in some places very large. The large types were vesicular containing very little chromatin, but deeply stained chromosomes. The tumor carried very little supporting tissue



Photograph showing exposed surface of large tumor mass in right frontal lobe separated by a cleft from a smaller mass encroaching upon the left.



Photograph of 6 slabs of 2 cm. thickness showing relative size and position of tumor mass.
Slab in lower right corner reversed so that right side of section appears on the left in the illustration.
Left upper illustration shows cleft appearing in photograph of whole brain.



of any sort. There were, however, numerous vessels and some strands of connective tissue. In some places these connective tissue masses were undergoing degenerative changes and numerous small hemorrhages for the most part associated with small vessels were noticeable. As a rule the tumor cells were well preserved and in some sections they showed a tendency to group themselves in a whorl-like arrangement around the vessels.

In the soft white matter mentioned in the protocol there occurred glia cells in increased numbers. Among these could be seen nuclei in the resting stage, cells with a marked increase of their protoplasmic bodies which had not reached the stage of fibril formation and others active in fibril production. There were very few phagocytes in this area.

SUMMARY.

The case is that of a large endothelioma of the frontal region of the brain, located chiefly in the right frontal lobe, but also extending into the left frontal lobe.

The pathological findings are compatible with a tumor of slow growth.

The patient from boyhood possessed especial attainments. Fifteen years ago he suffered a nervous breakdown resulting in retirement from an active professional life. Subsequently there occurred periods of lethargy, depression and loss of ambition with final incapacity for self-support.

Beginning with a transitory period of unconsciousness, various neuro-muscular disturbances were apparent which were followed by apathy, somnolence and progressive mental deterioration, which symptom complex in the absence of thorough neurological examinations led to the diagnosis of general paralysis.

The writer wishes to express his thanks to Dr. S. T. Orton for the foregoing autopsy report and helpful suggestions.

THE CURABILITY OF INSANITY.*

By A. I. NOBLE, KALAMAZOO, MICH.†

Half a century or more ago some of the leading psychiatrists of this country were making remarkable claims for the curability of insanity. In a generous rivalry they cited the statistics of their respective asylums to substantiate their claims to the actual cure of 80, 90 and even a greater per cent of recent cases discharged. Through the dissemination of such reports public interest in insanity was undoubtedly awakened and a highly fictitious value as regards cure was accorded to hospital treatment. Indeed there can be little question that such optimistic misinformation had a great influence during the early constructive period of American asylums. In speaking of the success of these institutions, a distinguished English alienist of that time declared that it "excited the envy and despair of my confrères and myself." Soon, however, these wonderful successes were discovered to be apparent rather than real and to be dependent upon restricted observation, the confusion of persons and cases, the personal equation and some other defective methods of compiling statistics.

It is a matter of ancient history that with the passing of the pioneer psychiatrists referred to, the record of cures in some of their asylums suffered a tremendous drop, amounting in certain cases to 50 per cent. Our experience then became more nearly that of England and there was less disposition to question the famous formula of Dr. John Thurman, who traced the history until death of 244 patients at the York Retreat and deduced the following general rule: "In round numbers, of 10 persons attacked by insanity, five recover and five die, sooner or later, during the attack. Of the five who recover, not more than two remain well during the rest of their lives, the other three sustain subsequent attacks, during which at least two of them die." This indicates a permanent recovery rate of about 20

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per cent. Sir Arthur Mitchell in 1877 traced the histories of 1297 persons admitted to the Scottish asylums in 1858 and arrived at the same results. In 1879 Dr. Pliny Earle investigated the subsequent history of 25 persons, published by Dr. Woodward 36 years before as recent cases, recovered at the Worcester State Hospital, and the results were even more unfavorable than those upon which Thurman based his rule. There were but seven patients who did not have a second attack, 18 did have a second attack or more, seven had died insane, two were in almshouses long incurably insane, one had died at home who was never well but a few months at a time. Of the original 25, eight were living in 1879, and the writer believed that some of them would die insane.

Dr. T. A. Chapman in 1884 "collected statistics of 46 British asylums for (in most instances) 11 years, 1872 to 1882 inclusive," and he found a recovery rate of 37.95 per cent based upon the admission of 93,443 cases of insanity. Dr. Earle found a recovery rate of 29.15 per cent based upon 33,318 cases admitted to American institutions, while upon two other series of 23,052 and 14,372, at 20 American institutions in the former case and at 58 in the latter, the recovery rates were respectively 29.91 and 27.88 per cent. The conclusion drawn was that the recoveries of the British institutions were greater than the American by 8 or 9 per cent. It would be unfair to assert that the keenness of the English psychiatrists to effect cures has anything to do with this higher percentage, but it is only a year or two ago that the writer read an article published by one of them in which he attempted to show that the cures of the English asylums were proportionately as great as those of the English general hospitals.

Contrasting our efforts with those of an earlier day, it would be an absurd proposition to maintain that we have been less successful or, considering the enormous expenditure of energy and money in behalf of the insane in the last generation or two, that we have been no more successful, than our predecessors; and yet it might be difficult, as regards reported cures, to demonstrate a better understanding of insanity on our part or to prove the superiority of more elaborate and scientific methods of treatment.

Because there is "no standard definition of what constitutes recovery from insanity" and because "the percentages of re-

coveries reported from different institutions vary in an astounding degree," the statistician of the Bureau of the Census in his last report, in order to make what he regarded the most intelligent compilation possible, grouped all discharges from the hospitals for the insane in the United States under the headings, "Improved," "Unrecovered" and "Not Insane." He was undoubtedly warranted in making this classification, but he has involved in a hopeless tangle the recovered and the improved, and he has conveyed no accurate idea of the curability of insanity or of the real success of treatment. Thus upon this imperfect basis of discharges for continental United States he shows an *improvement* rate for the year 1904 of 76 per cent and an *improvement* rate of 34.5 per cent upon the more usual basis of admissions. Calculated in the latter way, the Michigan institutions show an *improvement* rate of 42.2 per cent for the same year.

If we compare the recovery rate, based upon admissions, of several asylums of this country, taken at random, we see at once the remarkable differences and no longer wonder that the census statistician found it impossible to reconcile the figures or to analyze the conditions which produced such varying results. Thus the percentages of the following state hospitals for the years, in most cases, 1908-1910 are:

State	Hospital	Per cent of recoveries	State	Hospital	Per cent of recoveries
Illinois.....	Elgin.....	19.18	Ohio.....	Dayton.....	17.03
Illinois.....	Kankakee....	13.33	Ohio.....	Cleveland....	29.21
Iowa.....	Cherokee....	10.16	Pennsylvania.....	Norristown....	26.63
Iowa.....	Independence..	21.00	Pennsylvania.....	Warren.....	14.68
Indiana.....	Northern.....	16.35	Pennsylvania.....	Harrisburg....	9.17
Indiana.....	Eastern.....	22.72	Pennsylvania.....	Dixmont.....	19.92
Louisiana.....	East.....	11.00	Virginia.....	Staunton.....	20.00
Maryland.....	Springfield..	21.73	Tennessee.....	Bolivar.....	36.26
Mississippi.....	State.....	15.53	Washington, D.C.	St. Elizabeth..	27.12
Minnesota.....	St. Peter.....	17.00	Wisconsin.....	Milwaukee....	24.56
Maine.....	Augusta.....	21.16	Michigan.....	All hospitals (1908-1910)	16.01
Maine.....	Eastern.....	15.84	Michigan.....	Ionia.....	11.70
Rhode Island.....	State.....	10.63	Michigan.....	Psychopathic..	13.06
Massachusetts.....	All hospitals..	13.47	Michigan.....	Traverse City..	14.70
New York.....	Manhattan....	24.80	Michigan.....	Kalamazoo....	14.91
New York.....	Utica.....	21.26	Michigan.....	Newberry.....	18.18
New York.....	Buffalo.....	29.88	Michigan.....	Pontiac.....	19.61
New York.....	Kings Park....	20.56			
New Jersey.....	Morris Plains..	25.27			

Of such an array of figures one is disposed to say, "How futile!" And yet within a year I have been requested by no less personage than a governor of a state, an intelligent man of an in-

vestigating turn, to give him the figures to show what state or institution was having the greatest success in treating the insane. No attempt was made to satisfy his curiosity; otherwise he might have been convinced by the above statistics that Bolivar, Tenn., is the Mecca toward which we should all hasten. The success attained there, it would seem, is just four times what it is in Harrisburg, Pa., and two or three times greater than in a number of other institutions, while the variations between states, and often between two institutions in the same state, are curious and perplexing. While it is to be presumed that all the institutions here represented are doing good work, some of the states are preeminent in their care and treatment of the insane, although the percentages do not always clearly indicate it.

Assuming that the Kalamazoo State Hospital in point of efficiency occupies an average place with respect to the other institutions of the state and country, let us examine the character of its admissions and discharges for a short definite time, say for the last biennial period (July 1, 1910, to June 30, 1912), since in this way we shall arrive at a more intelligent opinion as to what may be expected from hospital treatment of the insane than did our predecessors who, in making their prognostications, were wont to lay great stress upon the duration of a psychosis and who did not, I believe, make the diagnostic investigations which we now regard as essential and the first step toward rational treatment.

There were admitted to this hospital during the two years selected (1910-1912) 960 patients, 516 men and 444 women. These patients were carefully examined and for the most part classified upon admission. We find them arranged upon the chart in 13 groups, the last of which includes a few aberrant cases not easily classified. Some of the groups, as will be seen, are broad in their scope and embrace several subdivisions, and others are restricted to a single type. Some of them refer to forms of mental disease generally classed as curable, while others suggest a decidedly unfavorable prognosis.

Taking up these groups in order and to some extent analyzing the results of treatment, we find that Insanity Due to Intoxication includes 8 per cent of the admissions, that 6.7 per cent are covered by the general term alcoholic insanity, while 1.2 per cent were drug cases, and there was one case of Korsakow's psychosis. We

Admission	REMAINING JANUARY 1, 1913					RECOVERED BETWEEN JULY 1, 1912, AND JAN. 1, 1913					PATIENTS REMAINING JANUARY 1, 1913, WHO MAY RECOVER				
	Men	Women	Total	Classification	Admission	Men	Women	Total	Classification	Admission	Men	Women	Total	Classification	Admission
P. ct.				P. ct.	P. ct.				P. ct.	P. ct.				P. ct.	P. ct.
3. .83 .10	21 2 1	2 2 0	23 4 1	35.3 33.3 100	2.3 .41 .10	2 0 2	0 0 2	2 0 2	3.07 1.4 1.0	.20 .20 .10	2 0 2	0 0 2	2 0 2	3.07 1.9 1.0	.20 .10 .10
.52	2	2	4	7.6	.41						1	0	1	1.9	.10
6.8 .62 .31 .62 .10	26 6 4 0	13 0 2 1	39 6 6 1	28 35.2 60 100	4.06 .62 .62 .10	0 2 2 2	0 2 2 2	2 4 4 4	1.4 1.4 1.4 1.0	.20 .20 .20 .10					
4.7 2.9	25 4	3 20	28 24	35 37	2.09 2.5										
8.7	39	35	74	69.8	7.7										
.10 1.8	0	15	15	53.5	1.5										
8.9 .10	20	41	61	31.7	6.3	7	11	18	9.3	1.8	7	14	21	10.9	2.18
.72	1	5	6	26	.62						0	1	1	4.34	.10
3.1 .62	13 1	7 2	20 3	42.5 27.27	2.08 .31	0	1	1	9.09	.10					
3.2	14	13	27	51.9	2.8										
.41	2	2	4	44.4	.41										
.41	0	3	3	10.3	.31										
.31	1	1	2	20	.20	0	1	1	10	.10					
48.87	182	169	351	848.77	33.44	9	15	24	32.86	2.40	10	15	25	20.21	2.58

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Group		ADMISSIONS				RECOVERED				IMPROVED					
		Men	Women	Total	Admission	Men	Women	Total	Classification	Admission	Men	Women	Total	Classification	Admission
I	Insanity due to intoxication:				P. ct.				P. ct.	P. ct.				P. ct.	P. ct.
	Alcoholic insanity.....	59	6	65	6.7	17	2	19	29.2	1.9	7	0	7	10.7	.72
	Morphinism.....	5	7	12	1.2	0	2	2	16.6	.20	0	1	1	8.3	.10
	Korsakow's psychosis.....	1	0	1	.10										
II	Infective-exhaustive psychosis.....	10	42	52	5.4	5	9	14	26.9	1.4	0	5	5	9.6	.52
III	Definite structural change in nervous system:														
	Arteriosclerotic brain disease.....	97	42	139	14.						5	3	8	5.75	.83
	Syphilis of brain.....	15	2	17	1.7						4	0	4	23.5	.41
	Head injury.....	2	1	3	.31										
	Huntington chorea.....	4	6	10	1.										
	Multiple sclerosis.....	0	1	1	.10										
	Syphilitic brain and cord disease.....	1	0	1	.10										
	Brain tumor.....	3	0	3	.31										
	General paralysis.....	69	11	80	8.3						3	0	3	3.7	.31
	Senile insanity.....	19	45	64	6.6						0	2	2	3.1	.20
	Paralysis agitans.....	1	0	1	.10						1	0	1	100	.10
IV	Dementia præcox.....	52	54	106	11.						4	5	9	8.4	.93
V	Paranoia.....	1	1	2	.20										
	Paranoid states.....	0	28	28	2.9	0	1	1	3.5	.10	0	2	2	7.1	.20
VI	Manic-depressive insanity.....	86	106	192	20.	24	27	51	26.5	5.3	15	15	30	15.6	3.1
	Manic-depressive provisional.....	0	1	1	.10										
VII	Melancholia.....	2	21	23	2.3	0	1	1	4.3	.10	0	4	4	17.3	.41
VIII	Arrested mental development:														
	Imbecility.....	32	15	47	4.8						5	2	7	14.8	.72
	Idiocy.....	1	0	1	.10										
IX	Hysterical insanity.....	1	10	11	1.1	0	2	2	18	.20	0	2	2	18	.20
X	Epileptic insanity.....	31	21	52	5.4	0	1	1	1.9	.10	8	0	8	15.3	.83
XI	Psychopathic states.....	3	6	9	.93	1	1	2	22	.20	1	1	2	22	.20
XII	Not insane.....	14	15	29	3.										
XIII	Unclassified.....	7	3	10	1.						3	1	4	40	.41
	Total.....	516	444	960	98.75	47	46	93	148.00	9.50	56	43	99	323.15	10.10

DISCHARGES												REMAINING					REMAINING					RECOVERED					PATIENTS				
												JULY 1, 1912					JANUARY 1, 1913					BETWEEN JULY 1, 1912, AND JAN. 1, 1913					REMAINING JANUARY 1, 1913, WHO MAY RECOVER				

should agree that the expectancy in this group is fairly good, and yet two years from the beginning* of the period only one quarter of them had been discharged as recovered, 10 per cent of them had been discharged as improved, 3.8 per cent as unimproved, 10 per cent had died, 48.7 per cent were in the hospital at the end of two years, and 35 per cent six months later with the prospect that less than 7 per cent of the residue would ever recover.

The Infective-Exhaustive group, which also ranks as curable, comprises 5.4 per cent of all admissions. Of this class, about 27 per cent were discharged as recovered, 9.6 per cent as improved, while more than half of them (53.8 per cent) died within the period, and 9.6 per cent remained at the end of that time. Six months later there were still remaining 7.6 per cent of the whole number with the prospect that one of this number might recover.

Group III, of which we may predicate some definite structural change in the nervous system, is naturally rated as incurable and includes 32.51 per cent of all admissions. The recovery columns in the chart opposite the divisions of this group are blank, although improvement is noted in 5.7 per cent of the cases of arteriosclerosis and in 23.5 per cent of the cases of brain syphilis. Improvement was also seen in general paralysis, senile insanity and paralysis agitans. Of the class 4.3 per cent were discharged as not improved and 41 per cent died in the two years, while at the beginning of the year 1913 there was a hopeless residue in the hospital of nearly 33 per cent.

In the Dementia Præcox group we find deteriorating cases amounting to 11 per cent of all the commitments. There were no cures among the discharges of this class of patients, and the improved number not quite one per cent, the unimproved 11.3 per cent, the deaths one-tenth of one per cent, and those still in the institution at the end of the period and six months later were 79.2 per cent and 69.8 per cent respectively.

Group V includes two cases that were classified as pure paranoia and 28 cases of insanity which were provisionally termed paranoid states. Together these constituted 3.1 per cent of all admissions, and are regarded as incurable. The one cure which took place among the paranoid states was probably due to a mistake in diagnosis. Nearly two-thirds of them remained in the institution at the end of the period and one-half the whole number at the beginning of this year.

Group VI embraces the large and important class of manic-depressives. They constitute 20 per cent of the admissions and are the most curable class. Notwithstanding this, only a little more than a quarter of them (26.4 per cent) recovered, 15.5 per cent of them were discharged as improved, 3.6 as unimproved, 9.3 per cent died, while 45 per cent remained in the hospital at the end of the period and 31.6 per cent six months afterwards with a favorable prognosis as regards cure in only one-third of them.

Some of our favorite authors have decided to no longer regard melancholia as a distinct entity, but it is retained in our classification, and is distinguished from the previous group, for example, "by the lack of degenerative and hereditary elements, by its appearance at an advanced age, by the absence of motor and psychic inhibitions, and by the existence of crises of anxiety with delirious ideas, and by an altogether different evolution," although there may be more warrant to relegate it to a pre-senile group. We have here included 2.3 per cent of the admissions. Of these 4.3 per cent were discharged as recovered, 17.3 per cent as improved, 21.7 as unimproved, while 26 per cent died and 30.4 per cent remained in the institution at the close of the period and 26 per cent half a year later with the prospect of one further cure.

Group VIII, Arrested Mental Development, included imbecility and idiocy, or 4.9 per cent of the admissions. Of these 14.6 per cent were discharged as improved, 21.2 per cent as unimproved, and 63.8 per cent remained in the hospital at the close of the two years, this number being reduced one-third in the following six months.

Hysterical Insanity, found under Group IX, constitutes only a trifle more than one per cent of the admissions. This must be classed as a recoverable form of mental disease, since 18 per cent of this number recovered. An equal number were discharged as improved, 9 per cent as unimproved, while there remained under treatment 54.5 per cent at the end of two years and 27 per cent at the end of two and one-half years.

Although arrested mental development is sometimes associated with epilepsy, we have assigned to Group X 5.4 per cent of all admissions. One woman of this number recovered from her

psychosis, but not from epilepsy, 15.3 per cent of them were discharged as improved, 13.4 per cent as unimproved, 9.6 per cent died, and 59.6 per cent remained in the hospital at the close of the biennium, this residue becoming about 52 per cent six months later with no prospect of recovery.

In Group XI, Psychopathic States, are included the neurasthenics, psychasthenics and a few cases of abnormal personality, together amounting to less than one per cent of all the admissions. Of this small number 22 per cent were discharged as recovered, an equal number as improved, and 11 per cent as unimproved, while 44 per cent with a poor prognosis remained in the institution two and a half years from the beginning of the biennial period.

Group XII is made up for the most part of voluntary patients who are not insane. They constitute three per cent of the admissions.

Group XIII consists of one per cent of our patients, who lack the definite symptoms necessary for classification.

There were, then, committed to the Kalamazoo State Hospital, during the biennial period referred to, 960 patients. Of these 381, or about 40 per cent, were suffering from what might be termed curable forms of disease and 579 from incurable forms. The recoveries tabulated in the two years were 93, or 9.5 per cent of the admissions, those discharged as improved 10.19 per cent, unimproved 7.22 per cent, while 20.79 per cent died, and 48.87 per cent remained in the hospital. In the six months following the period this remnant was reduced to 35.44 per cent and the cures had been increased by 2.40 per cent, making the total cures in two and a half years 11.9 per cent of the original admissions. Moreover, there was a probability that 2.58 per cent more of these patients would eventually recover. Disregarding the small and uncertain per cent of patients who may have recovered at home, this would make possible, so far as these particular patients are concerned, a complete recovery rate of 14.48 per cent, and applying Thurman's rule, a permanent recovery rate of, approximately, 6 per cent.

Past and present conditions seem to warrant us in assuming that we shall not make very much greater inroads upon these diseases in the near future, although a general survey of the state

with reference to all defectives might result in broadening the scope of hospital activity and in establishing and maintaining, at the expense of the state, social and eugenic workers who would accomplish much for the individual and the community. I believe that very few of our leading psychiatrists are now especially enthusiastic over the prospect of cure from insanity as a general proposition. Formerly there were many such—some from honest conviction and probably some from selfish motives. To me this is a good omen. While research and experimentation, which we should not in the least abate, and improved methods of treatment will sometime bring greater results, still it is absurd for us to attempt so little toward preventing the flood which threatens to overwhelm us.

There is probably no doubt in our minds that alcohol, directly or indirectly, is a potent factor in the production of insanity and the various neurotic conditions which are so apt to develop into psychoses. The questions involved are medico-social in character, and no one is better qualified to take the initiative in their settlement than the medical man. It is not rational or ethical for the medical profession to remain passive while treatment in these cases goes by default or while the public is viciously swindled by the so-called "jag cures" which flourish on every side; nor should the profession fail to act energetically if it is convinced that there is a better and more scientific method of treating inebriety than obtains at the present time.

I believe that we should colonize the alcoholics, that we should segregate and colonize and sterilize the epileptic and the feeble-minded, and I believe that we should do it now.

A CASE OF EPILEPSY.*

By E. V. SCRIBNER, M. D., WORCESTER, MASS.

While I have but one particular case of epilepsy which I propose to present, as there are many features of this case in which questions of diagnosis might be raised, I have considered it of importance to preface my presentation with some observations on epilepsy in general.

Epilepsy is one of the oldest diseases of which we have any recorded and adequate description. It is quite natural that this affliction should have early attracted the attention of medical observers because of the striking and spectacular character of its manifestations and the difficulties which have been met in the attempts to treat it. There seems to be no essential difference in the description of the early writers from that which would apply to-day to the easily diagnosed cases of the disease. With the advancement of our knowledge of the subject, however, many formerly obscure and poorly understood conditions are now recognized as epilepsy, thus broadening and extending the classification of this disease.

Idiopathic epilepsy is essentially a disease of degeneracy. One author finds defective heredity in 87 per cent of his cases in which he has a complete history, and in over 25 per cent there was epilepsy in the person of one or both parents. In general, epilepsy is a disease of childhood and youth, the majority of cases occurring before the age of twenty.

While the diagnosis of epilepsy is usually easy, there are times when there may be confusion with other conditions, the chief of which is hysteria. In epilepsy the mental and physical symptoms predominate, while in hysteria emotional disturbance is most marked. In the one the onset is sudden, in the other gradual. In epilepsy an aura is common, but lacking in hysteria. The former is usually of a few minutes duration while the manifestations of the latter may continue for hours. Then again the convulsions and postures of epilepsy are mainly governed by the flexor

* This paper forms contribution number fourteen of Worcester Hospital (Mass.) Series of 1912, offered in compliment of Dr. Hosea Mason Quimby on the event of his retirement from the superintendency after 20 years of service.

muscles. In hysteria there is a tendency to extension, opisthotonos—the so-called “crucifixion attitude.” In epilepsy the sphincters are often relaxed, in hysteria rarely. In hysteria there can usually be detected an effort at spectacular display. In some cases of epilepsy, particularly in women, there may be a large hysterical element which so masks the symptoms as to sometimes make differentiation difficult. In the particular case which I have under consideration sometimes the genuine epileptic manifestations were completely masked by the hysterical display. Many of her convulsive attacks were hysterical in character. I have, even in the male, seen fits manufactured for the occasion, interspersed with the genuine article. There is usually, however, little difficulty in recognizing the true epileptic convulsion.

Though most epileptics escape actual insanity, according to Peterson only about 10 per cent of all cases being so afflicted, in the majority there is some mental deterioration. This deterioration doubtless depends upon some general and profound disease of the cortex. One theory is that genuine epilepsy is due to a toxic condition arising from faulty metabolism. An attempt has been made to combat this condition with serum therapy. Not only has serum from external sources been used, but even serum from the same individual has been given. Chronic epilepsy is almost always accompanied by some dulling of the intelligence, though it seems a well assured fact that some of the strong characters in history, mentally alert and able men, have suffered from this disease. The mental deterioration is not always in proportion to the severity of the convulsions, indeed the mental results in petit mal seem more disastrous than in the major attacks. In all forms of the disease the mental failure seems to bear a direct relation to the frequency of the attacks. Even where the mental impairment is slight there is a distinctly diminished capacity for work in the higher grades.

The case to which I am calling your particular attention has been one of the most difficult to properly treat and care for with which it has been my fortune to be brought in contact during my whole asylum experience.

R. C. is a young woman about 33 years of age. She was born in the Azores, of Portuguese parentage—single—school girl. The assigned cause of her mental disease is given as “heredity.” Her mother is said to have

been epileptic. She had been insane for about five years before she came under my care. She remained in the asylum nearly seven years, making the whole known duration of the disease—about $12\frac{1}{2}$ years—a length of time which should, in the ordinary course, have found the patient deeply demented with no hope of recovery and but little or no amelioration of condition. The event, however, has been contrary to all precedent and expectation, as you shall see. The diagnosis, on admission, was epileptic insanity. She was noted also as hysterical. In my experience, suicidal attempts are rather uncommon in the epileptic, but in this patient the most desperate suicidal tendencies existed. Throughout her whole hospital residence this tendency has been one of the most distressing features of the case. A suicidal disposition was manifest early in her disease. On admission to the asylum she was childish, petulant and irritable. Immediately after an epileptic seizure she was violent, destructive and suicidal. She had periods when hallucinations of sight and hearing were marked. Her fits were chiefly of the major variety and occurred sometimes every day or two. Then there would be an interval of two or three weeks without any seizure. After a series of fits she generally became stupid for a short time and then extremely resistive, constantly trying to kill herself. Her condition was so extreme that she required a special attendant, sometimes more than one, night and day. During some of her excitements hallucinations of sight and hearing were specially acute. She said that her people came around the building by night and day. She thought that her brothers and sisters were endeavoring to make her suffer for their sins. In some of her excitements, following convulsions, it required the services of five or six nurses to restrain her and prevent suicide. On such occasions she would throw herself about the ward with complete abandon, striking her head against the wall or seat with great force, scratching and biting when interfered with. During her intervals she was usually very quiet and ladylike, attending dances and other chapel entertainments and making no trouble, though always with a private nurse. At these times she would go out on the street and into the shops and make excursions on street cars. On none of these occasions did she ever make any trouble. She was always in the care of a special attendant. The self-restraint which she exercised on these occasions was really wonderful. This is not an uncommon occurrence. Barr, in his book on "Mental Defectives," says that it was rather a common practice on his part to make certain of his patients' promise, before going to entertainments, that they would not have a fit in chapel. He says that this promise was rarely broken. He believes that the concentration of the patient's mind on the effort to prevent a fit was really sufficient, for a time, to ward it off.

My patient had not been long an inmate of the asylum when a discharge of pus began from one of her ears, showing a probable inflammation of the middle ear. On some occasions she passed through a period of deep depression when she seemed to fully realize her condition and surroundings. The hysterical and theatrical always was in evidence on slight provocation, even during her depression. Unless her attendants would

talk to her and pay her a great deal of attention she became very restless. She always desired to occupy the center of the stage, whether in grief, joy or excitement. She was, however, always watching for a chance to be alone. She frequently recounted the different ways of committing suicide, many of which she tried during the time that she was under my care. She varied her efforts between pounding her head against the walls, tying strings tightly around her neck and attempting to cut her throat. With many epileptics a period of excitement comes before the fits. This patient never complained of any distressed feelings before a seizure. Generally following a fit she would scream and bite continually, often remaining more or less unconscious for three or four days. When regaining consciousness she would become very irritable, occasionally talking to imaginary persons and at those times was more suicidal than common. As she grew better she would tell her attendants how easily she could kill them by choking them and then effect her release. At times she succeeded in acquiring a wonderful influence over her nurses, often terrorizing new employees so that she drove them from the service.

At the end of the first nine months of hospital residence her fits had seemed to increase in frequency. She had very noisy periods of pretty incessant screaming and contortions of the body, when it would require two or three or more people to keep her on her bed. At those times she seemed to know nothing at all about what was going on around her. After a time consciousness would return. The following will serve to illustrate the persistence and cunning of this patient in her suicidal attempts. For several days she had seemed pretty well, was cheerful and in no way depressed. About noon, as the other patients were going to the dining room, she was left alone in her room for a few minutes. A nurse, passing through the ward, stopped at the patient's room and looked in. Not seeing anyone the nurse was about to go out again, when a peculiar noise from somewhere arrested her attention. She looked under the bed and there found the patient with a clothing bag string tied around her neck and the other end hitched to the iron railing of the bed. The patient was blue, her face intensely swollen and respiration had ceased. The nurse removed the cord from the neck and at once sought assistance. Artificial respiration was at once instituted, but it was not until after about 15 minutes that the patient began to breathe regularly.

Seven days later the patient again found opportunity to wind something about her neck and respiration was suspended. This time it required 10 minutes of artificial respiration before the natural function was resumed. No specially ill effects seemed to follow these nearly successful attempts at suicide.

Some five months after the above occurrences this patient, in the middle of the night, asked her special nurse for a drink of water. As soon as the nurse went through the door the patient shut it after her and firmly barricaded it with her bed. She then broke out all the glass in her window, pulled down the electric light, tied a cord around her throat, with the other end made fast to the head of the bed, swinging her body beneath the

bed. It naturally took some moments before access could be had to the room. The door was broken in, the cord removed from the patient's throat and artificial respiration started. Strychnia was also given hypodermically. It was not until an hour later that the patient was out of danger.

During the following summer the patient seemed not so actively suicidal, or perhaps found no favorable opportunity, though she continued to have fits and excited periods with a few days intermission. Frequently the periods of excitement would occur without any convulsive attacks. This is a condition that frequently occurs in the epileptic, the period of excitement and confusion seeming to take the place of a fit—a so-called psychic equivalent. Sometimes fainting spells take the place of active convulsions.

For more than a year this patient continued to have convulsions at irregular intervals, sometimes the fits coming in series. From October 20 to November 6, 1905, she had 80 seizures, 58 occurring within a period of three days. One or two series were broken up with amyl nitrite. Between fits the patient became extremely excited and violent, screaming, jumping, banging her head against anything she could, biting, tearing the nurse's clothing, her exertions often leaving her deeply cyanosed. Some two months later this patient again succeeded in eluding her nurse and hung herself in the basement, being again restored by artificial respiration. On the second day following this attempt she fell into status epilepticus, on one occasion having 28 convulsions in an hour. Amyl nitrite again broke up the series.

Six months later this patient is reported as being much better mentally than at any time during her residence in the institution, having passed over this intervening period without known convulsions. This tends to confirm the statements of various writers that convulsive attacks have a distinctly dementing effect, though not always in proportion to the severity of the convulsion; because with the cessation in frequency of the fits a partial mental improvement follows.

During the following summer and autumn the patient alternated between quiet and excitement, with convulsive attacks at irregular intervals, interspersed with more or less active suicidal attempts. On thanksgiving night she attended the dance but seemed weak and excitable. For several days previous she had been much depressed, made her will and prepared for death. She was constantly talking about assistance in her designs that she was to have from someone about the institution. Her mind seemed to dwell on wood alcohol as a suicidal agent. The following account of what took place was given by the patient and that some of it must have been true is proved by the events which followed. She said that a former nurse procured poison for her, sent it through the mail, to be called for at the post office, and directed to a nurse still in the service. This latter nurse secured it and at the dance succeeded in passing it to the patient. She did not get a chance to take it until two days later when, about 8.40 in the evening, she asked her nurse to get some water for her, when from some source she got a small blue bottle which contained six small white tablets, one of which she took, throwing the remainder out of the window, as she could not hide them.

So much for the patient's story, now for known facts. Within a few hours she became very faint and for some time seemed to know nothing. At 7 in the morning her tongue was badly swollen and very dry. Her eyes were prominent and swollen, hands cold, pulse good, but her skin cold and moist. She could scarcely articulate because of the swollen condition of her tongue and throat. She complained of intense burning along the intestinal tract. There was enlargement of the lymphatic glands and spleen, with corrosion and loss of a great portion of the mucous membranes of the throat and to some degree of the stomach and intestines. The patient vomited large shreds of mucous membrane and passed large amounts by the bowels, along with considerable blood. She also expectorated blood in some quantities. The stomach was evacuated and salts given for some days in succession. It was not until three or four days that the patient seemed out of danger, but continued under treatment for three weeks. The patient led a somewhat uneventful existence for about a month when she again had acute symptoms similar to those mentioned above, but much less severe. The same treatment once more gave relief. This attack lasted for a week or two.

About a month later, one day, about 3 p. m., she had several fainting spells; her face became pale, head and hands cold and pulse poor. At 4.30 she collapsed. Her face, lips and hands were cyanosed to a deep blue, as were her gums. Ptyalism was marked, saliva simply flowing from her mouth, tongue swollen, with imprints of the teeth along the edge. She complained of a burning sensation along her esophagus and stomach and was unable to articulate distinctly on account of partial paralysis of her lower jaw and the condition of her tongue. She was at once given vigorous treatment to which she slowly responded, but remained in bed for a longer time than in her previous experiences.

After her recovery from this attack she made various conflicting statements as to the assistance which she received from nurses in carrying out her designs. Her statements seemed so unreliable that none would have been given credence if it were not for the very visible and tangible evidence afforded by the symptoms of acute corrosive poisoning. Someone must have conveyed to her some powerful drug which produced the symptoms related.

Following the escapades noted above, it seemed absolutely necessary to take more vigorous measures, so this patient was taken from her room and placed in a chair where she remained in plain view of everyone in the hall. At night she slept in a bed on the corridor of the ward in full view of the night nurses. For some ten days no apparent change was noted, but from that time there was a steady yielding and improvement in behavior, until the patient gradually became quiet, cheerful and industrious, being helpful in the ward work and taking an active and intelligent interest in everything around her. Her complaints ceased and she became in every way a model patient. She continued for almost a year with very few excitements and those in diminishing intensity. For the last two months before leaving the institution she had no excitements at all. For eight

months she had been entirely free from delusions and hallucinations. For a little more than two years she had been free from convulsions of a distinctly epileptic character and had no convulsion of any nature for over 11 months.

During all this time of improvement she was suffering from an otitis media with usually a free discharge of pus. When this discharge became in any way checked she became somewhat irritated and nervous, but not to a serious degree. For a long time she was very helpful about the ward work, at first under the direction of a nurse, but for the last 8 months alone, and did the work well. She had two or three other patients working under her whom she directed. During meal times she looked after the diet cases, under supervision. She had several letters from her relatives in Portugal, and after a time was visited by her brother, who lived in New Bedford. She was discharged to his care, for removal to Portugal.

In reviewing this case we find an epilepsy of an extremely severe type, with very acute mental manifestations, which had existed for years with no apparent improvement. No drug which was ever administered had more than a passing and trivial effect until we came to the self-administration of the heroic doses of the violently corrosive substance which this patient took. What was this substance? There is but one substance which, in my opinion, could produce such a train of symptoms as it has been shown was produced in each of the three instances chronicled above, and that is mercury bichloride. The symptoms entirely substantiate the belief that my patient took mercury bichloride, and that she took $7\frac{1}{2}$ grains at each dose, as that is the amount contained in each tablet which is used for the making of the bichloride surgical solutions. That such doses can be taken and the patient live has been several times shown when this drug has been administered by mistake. In the Reference Handbook it is stated that the intensity of action of mercury bichloride varies in its effect on different individuals. As low as 2.78 grains may produce death. Severe symptoms have followed a dose as low as $\frac{1}{3}$ to $\frac{1}{2}$ grain. Recovery has followed such enormous doses as 31 grams (nearly an ounce), when there has been prompt treatment by a physician. Opium eaters are said to be peculiarly resistant; one case with this habit being cited where 28 grains of mercury bichloride were taken daily, without illness. Assuming that this drug was what was taken, from the time of taking the first dose of bichloride, my patient never had another distinctly epileptic convulsion while she remained in the institution, a period covering over two years. She did have several hysterical seizures, which in turn disappeared under the moral treatment which has been outlined above. At the time of her discharge from the institution she had had no fits of any nature for nearly a year.

I have been able to follow the history of this patient from the date of her discharge until the present time. She went to the Azores to the home of her uncle there. She kept up a pretty regular correspondence with various persons at the Worcester Asylum. Her uncle's home not proving congenial, she found employment in a local hospital conducted by the

Sisters. This hospital had a department where the insane were cared for. My former patient and now nurse made herself very useful there. She was not contented, however, and longed to return to America. In several of the letters received from her she asked to have money sent her so that she could come back to this country. For a time but little was heard from her, when one day she suddenly appeared in Worcester, having landed in New York the day before. She earned the money and paid her passage herself, she says. I wrote the hospital authorities in the Azores for substantiation of this story, but received no reply. It is undoubtedly true.

The patient at that time seemed perfectly well, mentally and physically. In quite a long interview with her I could detect no trace of mental defect. Her mind was acute and active. At that time she said that she had had no fits since leaving the institution and that she had very little recollection of the more excited and stormy period of her hospital residence. After a short stay with a former hospital nurse she went to a nearby city and found employment as a nurse girl in a family where she remained for some time. A letter from her employer told me that my former patient seemed perfectly well and was an invaluable nurse girl. Some two years and seven months had then elapsed since her discharge from the hospital making nearly five years in all with no known return of the epilepsy.

After one or two changes in places of employment, where she continued to do well, my patient is alleged to have suffered an assault at the hands of some unknown man. A person was accused and a court trial followed, during which the patient conducted herself in a perfectly rational manner. Failing in her attempt at conviction of her alleged assailant, she commenced to act queerly and decided symptoms of mental alienation began to appear. It was soon necessary to have her again under hospital care, where she now is. She is much depressed and has made several suicidal attempts, though not of the serious nature of her former experiences. She is quite hysterical, and has convulsive episodes, though not of a distinctly epileptic character. For a long time this case seemed to show a complete recovery from long standing epilepsy, a recovery dating from the ingestion of the massive doses of mercury bichloride. The present attack is so largely hysterical that there still seems reasonable hope that a recovery may ensue.

PERSONALITY AND OUTCOME IN TWO HUNDRED CONSECUTIVE CASES.

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Certain ideas about the personality behind the psychosis have been brought to the attention of the psychiatrist. The theory set forth by Meyer¹ of habit-disorganization, the description by Hoch² of the shut-in personality, the emphasis placed by Freud and Jung on lack of adaptation in the sexual sphere, have brought into prominence mental factors and personality as causes of mental disease.

With these writers the important method of attack has been the thorough analysis of the development of unhealthy reactions in the individual case; in the present paper, on the contrary, an attempt is made to give a superficial survey of personalities and outcome in two hundred consecutive cases. Taking unselected cases written up with no special interest in personal traits, with histories coming from sources of varying reliability, it is plain that many errors will be included. But it is with such material that all clinicians are working, and it is of practical interest to see what principles shine through data that are in many respects inadequate.

I cannot find that this problem has been attacked before in this way. Hoch gives some percentages for dementia præcox cases; Zablocka,³ in her article on Prognosis in Dementia Præcox, gives percentages of degrees of dementia in normal and other personalities; Abbot⁴ and the writer have published percentages of normal and abnormal makeups in dementia præcox and manic-depressive psychosis. Such of these figures as can be compared with the results of the present study will be found in Table III.

The material is equally divided between cases from a private and a state hospital. At McLean Hospital, beginning with February 26, 1908, one hundred admissions were taken in order, only those being discarded in which no mention of the patient's personality was made by an historian not the patient. One hundred admissions from the Danvers State Hospital were collected in exactly the same way, the first entering on November 13, 1907. Traits con-

sidered were those which existed before the apparent onset of the psychosis. The four or five years' interval from admission to the present time has in most instances allowed the outcome to be satisfactorily determined.

At the end of the paper will be found abstracts of 17 cases lettered from A to N, which are chosen to give an idea of the atypical cases considered.

The first division of the material was by disease-groups, with a cross-division of normal⁴ and abnormal, the material from the two hospitals being kept separate for comparison and to allow the figures to show percentage as well as number of cases.

TABLE I.

	Manic-depressive	Dementia praecox	Constitutional inferiority	Epilepsy	General paralysis	Alcohol	Tumor, goitre	Involution	Arterio-sclerosis	Senile	Undiagnosed	Total
Normal:												
McLean.....	48	0	0	1	6	4	1	2	2	0	14	78
Danvers.....	22	7	4	2	7	7	2	2	1	10	6	70
Abnormal:												
McLean.....	2	8	5	0	1	0	0	0	0	0	6	22
Danvers.....	3	9	9	0	1	2	0	0	2	1	3	30

Separating from the normal group of Table I the cases definitely described as social, and from the abnormal group those definitely described as seclusive, we have Table II. Such a division is

TABLE II.

	Manic-depressive	Dementia praecox	Constitutional inferiority	Epilepsy	General paralysis	Alcohol	Tumor, goitre	Involution	Arterio-sclerosis	Senile	Undiagnosed	Total
Social.....	19	0	0	2	2	3	1	2	1	2	6	38
Normal.....	51	7	4	1	11	8	2	2	2	8	14	110
Abnormal.....	2	5	11	0	2	1	0	0	2	1	6	30
Seclusive.....	3	12	3	0	0	1	0	0	0	0	3	22
	75	24	18	3	15	13	3	4	5	11	29	200

possible because on listing the social cases all were found to fall within the normal group, and similarly all the seclusive cases, with possibly two exceptions (Cases D & E), were already classified under abnormal.

Thus only three persons (Cases A, B and C) are classified as seclusive under manic-depressive psychosis, and only seven as normal under dementia præcox (Cases H to K).

To read these results as percentages, and to compare them with those obtained by others, Table III is necessary. In it the consecutively chosen series of four important disease-groups are compared as to the personalities in which they arise, and paralleled as far as possible by series obtained from other writers.

TABLE III.

PERCENTAGES OF DIFFERENT PERSONALITIES IN FOUR PSYCHOSES.

	Manic-dep.	Involution Senile Arterio- sclerosis	Alcohol General paralysis	Dementia præcox	Hoch D. P.	Kirby D. P.	Hoch D. P.	Abbot and Bond	
								D. P.	M. D.
Normal....	93	85	80	29	23	Very small	8	68	86
Abnormal..	2	15	8	20	15	..	24	12	10
Seclusive...	4	0	3	50	51	50	68	20	4
Number of cases..	75	22	28	24	72	100	38	50	50

Very striking is the agreement between the manic-depressive cases, the group with alcohol and syphilis as causal factors, and the group which has the downward changes of age as a causal factor. In contrast, the essential difference of dementia præcox stands out in all the percentages given. The present figures show a larger number of normal personalities becoming dementia præcox (Cases H to K) than do Hoch's; but the columns dealing with this disease show a more striking qualitative agreement than quantitative difference.

In conclusion the material may be viewed from another viewpoint. In the two hundred consecutive cases thirty-eight were described as social; what has become of them in the following four or five years? What has become of the seclusive cases? Table IV answers the preliminary question; in what proportions did those

possessed of a certain kind of personality succumb to the different disease-forms?

TABLE IV.
PSYCHOSES DEVELOPED IN DIFFERENT PERSONALITIES.

Read columns down. Fractions omitted	Social	Normal	Abnormal	Seclusive
Manic-depressive	50	46	6	13
Senile, arterio-sclerotic and involution psychoses	13	11	10	0
Dementia præcox	0	6	16	54
Constitutionally inferior	0	3	36	13
Alcohol, general paralysis	13	17	10	4
Cerebral tumor or hæmorrhage				
epilepsy, exophthalmic goitre....	8	3	0	0
Undiagnosed	16	13	20	13
	100%	100%	100%	100%
Number of cases	38	110	30	22

The outcome in the 38 cases especially described as social may be stated as follows:

The average age at onset of first attack was 39.

19 became manic-depressive cases; of these

13 recovered.

3 died by suicide.

2 were deported and not again heard from, and

1 was discharged improved.

The average age at first breakdown was 35.

2 became epileptic at 33 and 42.

6 succumbed to alcohol, syphilis, or general paralysis, at an average age of 35.

5 reached the average age of 65 before succumbing to psychoses characteristic of the involution period.

6 remained unclassified; of these

3 recovered.

3 left the hospital and are lost.

The average age at first attack was 35.

Similarly, the outcome in the 22 cases described as seclusive is as follows:

The average age at onset of first attack was 26.

- 3 became manic-depressive cases and recovered, average age 33. (Cases A, B and C.)
- 12 became dementia præcox; of these
 - 2 died.
 - 10 remain in the hospital.
- 3 were constitutionally inferior and were not reckoned in the age averages.
- 1 acquired acute alcoholic insanity at 37, and recovered; the meagre description reads only "melancholy and reserved."
- 3 remain unclassified; of these
 - 1 died, "always abnormal," worse at 53 (Case N).
 - 1 discharged "much improved" and lost, onset at 19.
 - 1 still in hospital, onset at 35.

Between these two groups there is a striking difference as regards hospital residence. The social personalities have been able to last 13 years longer than the seclusive without breaking down. Leaving out those cases evidently inferior from birth, those in whom there is an evident exogenous causal factor (alcohol, syphilis), and those who have been able to reach the declining years of life without upset, we find 50 per cent of the seclusive group still under institutional care in contrast with only $2\frac{1}{2}$ per cent of the social group.

SUMMARY.

1. Four tables are presented which show personalities and outcome in 200 consecutive cases.
2. Seventy-four per cent of these are found described as normal, 26 per cent as abnormal; 19 per cent as social, 11 per cent as seclusive.
3. Dementia præcox is seen to differ sharply from manic-depressive, alcoholic, post-syphilitic and involution period psychoses in regard to the personalities in which it is found.
4. Normal personalities are noted in 93 to 85 per cent of manic-depressive, alcoholic, paretic and involution period psychoses; but in only 29 per cent of dementia præcox cases.
5. Seclusive personalities are noted in less than 4 per cent of manic-depressive, alcoholic, paretic and involutional period psychoses, but in 50 per cent of dementia præcox cases.

6. As regards hospital residence only $2\frac{1}{2}$ per cent of the social cases, in contrast to 50 per cent of those who showed a seclusive tendency, are still in the hospital at the end of a four-years interval.

ABSTRACTS OF ATYPICAL CASES.

CASE A.—Male; 20; family history good; born after normal labor; a well baby; slow in learning to talk; bashful; could not learn with people about him; never did consistent or steady work; not fond of sports or his fellows; was restless; sat by himself; was thoughtless; kind hearted; fond of novels; never physically sick; of late has used much tobacco and accuses himself of masturbation.

Two years before entrance had slow fever. After slow fever came a mild excitement for a year, then a depression, another excitement, another depression.

After two months stay at the hospital he was discharged as recovered. Was admitted again in an excitement in 1911 and discharged early in 1912; again recovered. He was very sociable and open in his excitements when seen at the hospital; he made many friends. *Seclusive; M. D.*

CASE B.—Male; 27; father very nervous; a normal baby; very sensitive to slights; had not many friends or new interests; up to 23 his only exercise was walking; since then he has taken up swimming; very fond of books and of the theater, but preferred gloomy plays; after his mother's death and the burning down of his home he became self-accusatory, retarded, hallucinated. He recovered after nine months. *Seclusive; M. D.*

CASE C.—Married woman, age 55, who was never physically well as a child; easily offended; over-estimated the faults of others; very positive; not sociable to most people; hard to those she disliked; preferring to be left alone, but very cordial to a few intimate friends. After unhappy experiences, dream-like manic state, distractability, flight of ideas; discharged well after ten months. *Seclusive; M. D.*

CASE D.—A married woman, age 35; bright; quick; high strung; nervous temperament; quick to anger; quick to get over it; not inclined to worry; very sensitive make-up; not especially fond of society or theater; liked tragedies; read serious things; rode horse back; occasionally drank; has ups and downs in mood; a typical manic case with good recovery.

This is a case showing the "artistic temperament" and seclusive traits, which still do not keep her from touch with the world; this and the next case are the most doubtful of all those classed as *normal; M. D.*

CASE E.—Male; age 22; considered normal as a boy; fond of outdoor sports; learned well; rather methodical in his studies; probably a little seclusive; at 8 showed abnormal sorrow for his mother's death; at Exeter was honor man at 17; conscientious; several definite manic and depressed attacks with perfect recovery. Classed as *normal; M. D.*

CASE F.—Married woman; age 34; quiet, unassuming, not caring much for companions but always bright and active; always well; was organist at church; a long drawn-out attack, mixed phase, followed by recovery. *Normal; M. D.*

CASE G.—Male; age 42; as a boy normal and bright; rather seclusive and gloomy; never held a responsible position; studied law but never practised; good student of languages; belonged to several clubs; used alcohol and tobacco; went with women. *Abnormal; G. P.*

CASE H.—Married woman of 35; one sister insane; a hard working, always cheerful woman who liked company; at 29 obscure delusions of infidelity; hallucinations; somatic delusions; untidy; becoming more and more apathetic. At present more demented; in the hospital. *Normal; D. P.*

CASE I.—Married woman; 34; good family history; a healthy child; bright scholar; quick tempered and impulsive; rather inclined to worry; insistent on cleanliness; very proud of her family; quite cheerful and sociable; after four years stay in the hospital, disoriented, apathetic. *Normal; D. P.*

CASE J.—Married woman, 44; average ability; doing well as a servant; always quiet; even temperament; of average religious feeling; now demented and still in the hospital. *Normal; D. P.*

CASE K.—A male of 42; bad family history; cheerful, amiable, agreeable; an only son; very precocious; affectionate; unusually sensitive; very popular and made every one his friend. After 22 years of hospital residence he shows many mannerisms; foolish delusions of grandeur. He was called *normal; D. P.*

CASE L.—Male of 53; bad family history; very timid; too timid to plead in court; reserved; unsociable; suspicious; bright lawyer. At 36 his suspiciousness increased and probably he then began a paranoid dementing process during which he was an inmate of at least eight hospitals. At 50 he is still in a hospital. Classified as *seclusive, undiagnosed*.

CASE M.—Male, 41; fairly healthy, getting little out of his school work; wilful; truant; wanted his own way; fought so much that other boys feared him. Later an active church member; a very good man. At 35 peculiar and jealous; at 41 exhilaration then depression; at 42 constantly hallucinated; at present in hospital, showing delusions of poisoning. *Abnormal; D. P.*

CASE N.—Male, 53 on admission; always eccentric; never cared for company or women; masturbated from 12 on; talked to himself as a young man. At 53 lost interest in his farm work, thought he was to be burned at the stake, in hospital resistive, unoccupied, suspicious and apprehensive till his death 13 years later. *Seclusive; undiagnosed*.

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POLYNEURITIC DELIRIUM—KORSAKOFF'S PSYCHOSIS.*

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The polyneuritic or Korsakoff's psychosis has been recognized for many years. Although much has been written in regard to this interesting condition there are a number of disputed points and differences of opinion especially as to etiology prognosis and even as to the existence of such a disease entity. Moreover, when the frequent resemblance to severe organic states is considered the importance of a careful study of this psychosis must be realized.

It is not the purpose at this time to enter into a detailed discussion of Korsakoff's disease in all its aspects. Following a description of the symptom-complex a few of the more undecided points will be considered, especially emphasizing the results of an examination of a series of cases at the New Jersey State Hospital at Trenton.

In general, the symptoms may briefly be stated as delirium with confusion, disorientation, memory disturbances (*Merkfahigkeit*), with fabrications and pseudo-reminiscences, amnesic periods, hallucinations and delusions.

The mode of onset is somewhat varied. According to some authorities there is apt to be a prodromal period of irritability, nervousness and either insomnia or drowsiness, the latter in many cases being a profound stupor. Following sooner or later the patient enters into a period of active delirium varying in degree from a mild confusion and disorientation with hallucinations to a severe condition resembling the typhoid state.

Again, the case may begin with severe neuritic symptoms obscuring the mental phenomena which appear later. Still a third method of onset according to Bonhoeffer is a slowly developing increasing memory weakness.

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A most usual mode of onset is that of an acute delirium resembling a delirium tremens in many ways. Because of this, and the continuance of the symptoms, some writers have suggested calling the condition "chronic delirium tremens." The patient becomes confused, disoriented, irritable and apprehensive, fearing he is to be harmed. He has horrible hallucinations of sight and is unable to sleep. He talks constantly to himself. Unlike delirium tremens, as Lambert has pointed out, the critical sleep does not appear. As soon as the acute stage is over the characteristic mental symptoms ensue. The demeanor of the patient may not be far from normal to a casual observer, but a few questions will disclose the peculiar state of mind. There is practically complete disorientation. The patient does not realize his surroundings. Although he may have been in the hospital in bed for some weeks, he thinks he is at home or at his place of business. He has no idea of time, the present date or the period during which he has been sick. On the other hand, he may recognize his friends, but in severe cases even recognition may also be disturbed.

The memory disturbances form the most peculiar and distinguishing feature of the disease, the memory for the immediate past being markedly defective. The patient is unable to retain the most recent occurrences. He cannot recall what has just been said to him (*Merkfähigkeit*). He does not know what has taken place the moment before, to whom he has been talking or what has been done. He may ask repeatedly the same questions and no amount of emphasis will enable him to remember what he is told.

The memory for earlier events is usually retained up to the onset of the sickness, although the amnesia may be retrograde and involve some time before the beginning of the trouble. In other cases the memory for past events may be quite perfect, although the sequence may become disordered, the patient for instance naming his different occupations or places of residence in the wrong order. Again, there may be only partial memory, unaccountable lacunæ or gaps occurring in his recollection.

Related to the amnesia and probably resulting from it and being perhaps an effort to cover up or fill in the gaps are the pseudo-remiscences, memory fabrications or falsifications. While the patient may have been confined to his bed for weeks, yet he describes journeys he has taken, people he has met, business deals,

details of work, conversations and various other things that have transpired which are entirely imaginary. These circumstances he will relate in detail, readily adding to the story at the suggestion of the physician.

The physical symptoms of neuritis may or may not be marked. Cases presenting the mental phenomena may show none of the characteristic signs of neuritis, or the symptoms may be overlooked, or may have passed away before the onset of the psychosis. The symptoms vary from only slight sensory disturbances to a severe state with paralysis and contractures. It is common to find pain and tenderness over nerve trunks and muscles upon pressure, especially over calves and biceps. The deep reflexes are apt to be diminished, absent or variable with wrist or ankle drop or both in the severest cases. There may be incoordination in bringing finger tips together or touching nose with eyes closed. The wasting of muscles is usually quite noticeable.

Pupillary disturbances are frequently present. Irregular, unequal pupils which may react sluggishly to light or not at all are found. Speech defects varying from simple thickness to an actual slurring are not uncommon.

The neuritic symptoms are usually most marked during the severe delirium and are disappearing or absent when the fabrications become well developed. Frequently the anamnesis has to be depended upon for the evidence as to a neuritis having been present.

In regard to etiology, alcohol was at first and for a long time deemed the most important if not sole factor. From time to time, however, cases would appear presenting typical symptoms of polyneuritic delirium in which there was absolutely no alcoholic history. Cases may be divided into three classes as to etiology. In the first place, those with alcoholic alone as the etiological factor are by far the most numerous and typical. As will be noted in the series under examination, alcohol was given as the cause in 75 per cent of the cases.

Again, alcohol may be associated with some chronic wasting disease, an infection or a traumatism.

Lastly, cases are recorded where alcohol has played no part in producing the disease. There seems to be an underlying basis of toxæmia due to other causes. Morphine, creosote, arsenic and

other poisons, tuberculosis, typhoid fever, puerperal fever, diabetes, gastroenteritis, malignant growths, etc., have all been given as the sole cause for polyneuritic delirium. It is a question whether or not all these cases should be called polyneuritic delirium. Where there are no physical signs of a polyneuritis and really the clinical picture of a delirium as in a wasting disease, with fabrications, why should this delirium be specially designated apart from that which could be explained by the basic disease?

In a chronic disease, such as tuberculosis with the appearance of a neuritis, care must be exercised not to mistake the cause of this condition. This was clearly shown by Salomonson who described "two cases of toxic polyneuritis in phthisis," and concluded that the polyneuritis was due to the creosote given and not to the tuberculosis *per se*.

The case described so fully by Hayman seems to have been a true example of polyneuritic delirium on a morphine basis, there being no alcoholic history. The physical signs included absent knee and achillis reflex, sluggish pupillary reaction, speech and writing defects, and mentally there were present the characteristic memory defects with confabulations.

Some investigators have found that Korsakoff's psychosis more commonly occurs in women than in men. Long-Landry in the "Clinic" of Paris states that "women are attacked in the proportion of seven out of ten cases." Stanley, in a recent paper, makes a similar assertion. Paton, however, reaches the opposite conclusion, and this seems to be borne out by the present series. When the fact that alcohol is the most common etiological factor is considered, it would seem reasonable to find the disease more often in men.

Pathologically considered, the characteristic findings expected in a case of multiple neuritis are seen together with certain other changes. F. Robertson Sims, in the cases he examined, found "acute degeneration of many peripheral nerves, axonal reaction in anterior horn cells, in cells of Clarke's column and in some cranial nerve nuclei and various non-systemic degeneration of intra-spinal fibers, together with acute or axonal alterations of various cells of the cortex. In one case proliferating glia cells were found in the neighborhood of altered Betz cells of the motor cortex."

The following case is reported in abstract, as a post-mortem examination was made:

C. K. Female. Born in United States. Age 30. Divorced.

Family History.—Negative.

Personal History.—Early life not unusual. Made good progress in school and took up music, remaining at home until her marriage at the age of 21. The marriage was regarded as satisfactory, but later on it was discovered her husband drank to excess. Since her marriage she has had four abortions induced with the knowledge and consent of her husband and they both have had gonorrhœa. She acquired the habit of drinking, and two years ago her husband parted from her, the grounds being her excessive drinking. Four months before admission he got a divorce and was married the following day. She (the patient) drank to excess following this, as much as a quart of whiskey a day.

Onset.—About four months ago began to be rambling in her talk, indifferent to her work. Twenty-five days before admission began to have hallucinations of sight, seeing monkeys in the trees, negroes coming in through the windows, etc. She did not seem frightened or tremulous. This lasted about a day and her physician gave her bromides after which she talked in a wandering way and was untidy. Was in a general hospital ten days before admission.

Admitted February 4, 1911.—Carried in on a stretcher, was stuporous and could not be aroused.

Physical Examination.—Height about 5 feet four inches, weight about 125 pounds. Patient semiconscious and delirious. Much atrophy of muscles of arms and legs. Excessive pain upon pressure over calves and biceps. There is double foot drop. Patellar and achillis tendon reflexes absent. Marked incoordination and tremor of extended fingers. Inability to stand. Speech slurring. Loss of control of bladder and rectum. Pulse weak, intermittent, rate 120. Pupils active. Tongue coated, breath foul. Urinalysis, 1030; acid. Heavy white ppt.; reddish amber. A trace of albumin. A yellowish offensive vaginal discharge.

Mentally patient in delirium, apathetic and indifferent to surroundings unless disturbed, when she cries out with pain. Answers to questions mostly incoherent and irrelevant. Fabrications quite marked. Hallucinations of sight and hearing. Complete disorientation. Marked memory disturbance. Lack of insight and judgment. Lumbar puncture findings were negative and general paralysis ruled out. Patient failed rapidly and died February 10, 1911.

I am indebted to Dr. F. S. Hammond, pathologist to the New Jersey State Hospital at Trenton, for the autopsy report and microscopical findings hereafter recorded.

The anatomical diagnosis was as follows:

A young white woman showing well marked muscular atrophy without evident significant loss of fatty tissue.

Dura and pia microscopically negative. Beginning basilar arteriosclerosis as shown by small patches of grayish white color in the major trunks.

Brain of small size with reduced consistency without detectable atrophy or other gross changes—1120.

Spinal cord removed. Negative to naked eye.

Subacute bilateral plastic and fibrous pleurisy. Rather well marked bilateral posterior hypostasis and œdema with areas of collapsed tissue and beginning broncho-pneumonia.

Slight mitral and aortic endocarditis of chronic type. Heart muscle markedly grayish and turbid. Left ventricle only partially contracted. Much subepicardial fat.

Incipient aortic atheroma. A few small scattered patches only. Coronaries clear.

Moderate splenic engorgement.

Rather well marked chronic interstitial hepatitis. Old adhesions about the upper and under surface of liver. Perhaps some cloudy swelling.

Stomach and intestines negative except for slight or moderate injection of mucous membrane.

Kidney usual size. Capsule firmly adherent. Substance of kidneys dark turbid red. Cortex bulges beneath capsule when cut.

Pancreas negative.

Adrenals show apparently some engorgement of the medulla and some central softening. Cause of death polyneuritic delirium (chronic diffuse nephritis with acute cloudy swelling).

MICROSCOPIC EXAMINATION.

Brain.—Nissl: Aside from the special alterations present in the large cells of the paracentral lobules and to a less degree elsewhere, on the whole there is quite good preservation of nervous elements. Pigmentation is not unduly conspicuous and with the exception of an occasional cell displaying the effects of granular disintegration there is little of significance in either the general run of cells glia or vessels.

The Betz cells, and to a considerably less degree the large cells in the calcarine areas, are the seat of a quite distinct axonal reaction. The principal features of this condition are that by no means all the large cells are affected and those in which the process is observed do not display the intense granular breaking up of the Nissl bodies and peculiar glassy appearance of the cell body usually seen in central neuritis. Although the nucleus is displaced and the chromatin altered, the process lacks the severity usually observed.

By Marchi, the paracentrals show very distinct fiber degeneration corresponding in severity to the axonal reaction in the cells. In the frontal and temporal areas the osmic spotting is quite strikingly small as compared to the paracentrals.

Spinal Cord.—Nissl: A well marked axonal reaction in the anterior horn cells most conspicuous in the dorsal and cervical regions. Pal: A

quite distinct thinning out of the columns of Goll in the dorsal and cervical segments not present in the lumbar segments. Marchi: Well marked peppering of the white matter throughout the upper levels, but distinctly more pronounced in the posterior columns and lateral marginal zones in the dorsal and cervical and noticeably less so in the lumbar.

Lumbar Ganglia.—Negative.

Gasserian Ganglia.—Negative.

Medulla.—Nissl: Moderate amount of nerve cell pigmentation. Marchi: Rather small amount of reaction noticeable; very much less than in the cord.

Peripheral nerves.—(Right and left—great sciatic, ulnar, median, posterior tibial, brachial plexus.) Nissl: Sections negative.

Marchi: In the nerves of the lower extremity a quite faint (or even doubtful?) reaction. A rather limited number of fine black pepperings. In those of the upper extremity, the medians particularly, a very evident reaction as shown by many plainly detectable black dots, clump and linear markings.

Spleen.—Chiefly characterized by marked engorgement of the pulp.

Lungs.—Mild grade broncho-pneumonia.

Pancreas.—Negative.

Thyroid.—Negative.

Adrenals.—Negative.

Heart.—Negative by eosin and thionin.

Kidneys.—Well marked chronic interstitial nephritis with high grade acute cloudy swelling.

Liver.—High grade periportal cirrhosis and fatty infiltration.

Pituitary Body.—Negative.

Small Intestine.—No changes of significance.

Left and Right Biceps, Left and Right Gastrocnemius.—Negative.

Before a further general consideration of Korsakoff's psychosis it may be well to analyze briefly the series of cases which have offered the excuse for this discussion.

There were 24 cases, 17 men, seven women. The ages of the men ranged from 30 to 68, those of the women from 30 to 48. Alcohol seemed the most important etiological factor in 14 of the men, and four of the women. In two male cases alcohol and trauma and alcohol and infection were associated. In one male case bromides, and in a female chloral and bromides, seemed to be the active causes. In one female the trouble started following an induced abortion with probable infection and exhaustion. In another, worry, grief and ill health.

The onset in 13 cases was acute, many times resembling delirium tremens at first, which became chronic. To be exact, the

onset in these was three weeks or less. In six cases the symptoms developed in from four to seven weeks, and in five cases they were several months in making their appearance.

In 62 per cent there were decided pupillary changes and in 87 per cent there was reflex alteration.

The neuritis was so marked in nine of the males and five of the females that the patients could not walk or help themselves in any way. Seven of the male and one female case did not have hallucinations. All but one (a female) showed fabrications, this one case having passed beyond that stage. All but this same case showed disorientation, retention defects and amnesia.

Twenty or 83 per cent recovered, 15 males and five females. One male only died, the cause being lobar pneumonia. Two females died, one of these having a severe chronic nephritis, the other being the case already reported under pathology.

Seven cases, two being women, were lumbar punctured, the spinal fluid findings being in each negative.

The importance of a careful differential diagnosis cannot be emphasized too strongly. Even with a fairly accurate anamnesis, one cannot always feel certain that the case is one of Korsakoff's psychosis, and without a good anamnesis the difficulties are multiplied. When it is seen that in the writer's cases 62 per cent showed pupillary changes, *e. g.*, either irregular, unequal or sluggish in reaction, 87 per cent reflex alteration besides tremors, writing and speech defects and incoordination, and frequently these physical signs are accompanied by expansive ideas, the possibility of confounding Korsakoff's psychosis with general paralysis is apparent.

In this connection it is interesting briefly to note two cases of the series. The following is not included among the 24 already mentioned.

Psychosis in Z. T. Colored, male. Age 49. Widower. Laborer.

Family History.—Negative so far as known.

Personal History.—Early life not unusual. Received a public school education and possessed ordinary intelligence. Has been drinking more or less all his life, for ten years to excess. Never arrested for disorderly conduct but frequently warned. Has been employed as a laborer, waiter, porter, etc. Agreeable disposition. Provided for his family.

Onset.—About four weeks before admission. Had been drinking to excess and had a convulsion about that time and another September 25,

1910. Was confined to bed and attended by a physician. A few days later was restless, violent and restrained. Gradually became more quiet and able to be on his feet, but weak and not right mentally.

Admitted to the New Jersey State Hospital October 20, 1910. Was disoriented.

Physical Examination.—Thin in flesh, poor muscularity. Sways when walking without assistance. Romberg symptom present. Speech defect. Tremor of extended fingers and toes. Patellar reflexes exaggerated. Tenderness over nerve trunks and muscles of upper and lower extremities.

Mental Status.—He was usually quiet, at times restless, wanting his clothes to go to work, etc. Talks spontaneously and answers questions relevantly. His mood was agreeable; at times he would become emotional, readily shedding tears. There were marked fabrications. Complete disorientation. No insight.

The diagnosis at first favored was Korsakoff's psychosis.

The fabrications continued but were not so marked.

His physical condition seemed to be improved. On January 25, 1911, he had a convulsion which was at first attributed to uræmia. The urinalysis, however, did not confirm this. He recovered to his former condition and lumbar puncture was performed. The spinal fluid proved positive for general paralysis, there being 293 cells to the cmm. The patient finally died and autopsy confirmed this diagnosis.

About the same time the following case was presented at staff meeting making a striking contrast to the above:

N. A. Psychosis in white man. Age 56. Married. A motorman.

Family History.—Negative except for the fact that his wife had three miscarriages.

Personal History.—Childhood and early life negative. Has worked at several occupations, farmer, engineer, etc. For the past 15 years has been employed as a trolley motorman. Married at the age of 24. Has never used alcohol. A steady and industrious workman. Always got along well with his wife. For the past 15 years has had a sore on lower leg which would break down about once a year. Had a bad attack of pneumonia last winter.

Onset.—Gradual. About ten weeks before admission began to talk and act a little queerly. Was obliged to stop work at that time because he was ill and nervous. Was quite restless. Must be moving about all the time. Had been given considerable bromide by physician's prescription, the same being renewed several times. About three weeks before admission became profane, talked of having large sums of money, owning a hotel at Atlantic City. Was at times emotional. Hallucinations of sight were present. Feared his imaginary money would be stolen. Showed fabrication.

Admitted to the New Jersey State Hospital January 24, 1911. Disoriented.

Physical Examination.—A well developed white man. Numerous white pitted scars over back and chest and arms. Ventral hernia at site of old abdominal operation (12 years ago for intestinal obstruction). No scars on genitals. Smell defective. Left pupil slightly larger than right. Reacts more sluggishly. Neither pupil gives a prompt reaction. Taste defective. Sense of position poor. No tenderness over nerve trunks or muscles. Patellar reflexes absent. Other reflexes are diminished. Balancing power very poor. Unable to walk in a straight line with eyes closed. Tremor of tongue and fingers. Writing and speech defects. Speech of scanning type. Heart sounds muffled and indistinct. Pulse slow and irregular. Urine contains albumin and casts.

Mental Status.—Restless, difficult to keep in bed, headstrong and obstinate. Disoriented. Memory defects. Emotionally changeable. At times exhilarated and often tearful. Expansive, ideas of possessing wealth. Fabrications, speaking of having been at various places, seeing various people and having different imaginary experiences.

From the marked physical signs and expansive ideas general paralysis was favored at the first presentation, but lumbar puncture was negative. The negative spinal fluid findings made the diagnosis Korsakoff's psychosis necessary. This patient finally made a complete recovery.

Thus, very graphically, the difficulties at times experienced in differentiating polyneuritic delirium from general paralysis and the important laboratory aid to this solution are shown.

A number of cases of Korsakoff's psychosis were lumbar punctured and pleocytosis was never discovered. Certain writers, I. M. Dupain and G. Lerat, claim to have found lymphocytosis in polyneuritic cases, but they have not recorded any differential cell count which would be important in such circumstances.

The possibility of Korsakoff's psychosis occurring in a general paralytic has been demonstrated.

The case Z. T., already cited, might be considered one of this kind. Kræplin showed the association of these two conditions.

Henderson of the New York Psychiatric Institute reported two such cases, one in 1909, another in 1910. One of these was a hack driver, 54 years old. He had a double wrist and foot drop, tenderness over calf muscles, marked exaggeration of the tendon reflexes. Pupils reacted promptly to light and accommodation. There were memory disturbances. The polyneuritic symptoms disappeared in a week's time.

The lumbar puncture showed a pleocytosis, positive globulin reaction and positive Wassermann of the blood serum and cerebro-spinal fluid.

Cases of this sort are the exception, however, and it is generally conceded in this country at least that lumbar puncture in polyneuritis shows no pleocytosis, thus making this diagnostic aid of vital importance.

Senile dementias may fabricate and present amnesia and memory disturbances similar to those found in polyneuritic delirium. In senile cases, however, the gradual onset, age of the patient, continued progressive deterioration, absence of neuritic symptoms, serve to differentiate this condition.

Certain traumatic psychoses, according to A. Meyer, present features of the Korsakoff's symptom complex, especially the fabrications and memory disturbances.

The following case very aptly illustrates the complication of a trauma:

E. W. White. 48. Widower.

Family History.—According to patient, father and brother alcoholic.

Personal History.—Patient picked up June 2 along trolley track with a fractured skull, punctured wound. Taken to Mercer Hospital where skull was trephined, left frontal prominence, and a small piece of bone removed. Patient became violent, was disoriented, evidently fabricated.

Onset.—June 2, so far as known.

Admitted to the New Jersey State Hospital June 19, 1910. He was talkative, good humored. Disoriented. Fabricated.

Physical Examination.—A fairly well nourished white man, height 5 feet 8 inches, weight 147 pounds. A history of venereal scars probably chancroidal in nature. Irregular scar about six inches long forming a flap over left eye, surrounding an irregular depression in skull, left frontal prominence, following trephining. Pupils unequal, left a little larger, irregular in outline, do not react to light. Unable to test well for accommodation. Slight external strabismus. Tactile, temperature and pain sense acute except in region of scar, left side of forehead. Considerable pain and tenderness upon pressure on calves. Reflexes less active on the right. Station unsteady. Swaying to left in Romberg position. Gait unsteady and staggering. Muscular power of legs seems diminished, does not keep them flexed well. Some difficulty in pronouncing "Peter Piper." Does not sleep well. Heart sounds weak and indistinct. Pulse 68, small, compressible, rather weak. A history of hemorrhoids. Liver dullness extends to umbilicus. Urine: light straw, turbid, 1010, acid: *microscopically*, bacteria present.

Mental Status.—A little restless and confused. Disoriented, fabricating freely according to suggestion until about July 4, when he became oriented for time and place. Mood, rather happy. Amnesic period for accidents and events following same. Confused in his accounts of his previous life.

Memory poor but improving. Retention fair. School knowledge fairly good. Insight and judgment defective.

It was learned from his employer that he drank to excess.

From the history of alcoholism, neuritic physical signs above enumerated which seemed to be clearing up, confusion, disorientation, marked fabrications, defective insight and judgment, alcoholic polyneuritic delirium, Korsakoff's psychosis was favored.

General paralysis would have to be considered but was excluded by recovery and discharge August 15.

The influence of the trauma was thought to be incidental or as the exciting cause. In the light of A. Meyer's teaching, however, it may be questioned whether or not the trauma was the cause of the peculiar delirium.

One case (McG.), age 65, on account of a history of several periods of unconsciousness, apprehension, irritability and partial disorientation with defective insight, arterio-sclerotic brain disease was considered. Later on, however, fabrications developed, the symptoms finally clearing up in the course of two months, and the patient was discharged, the diagnosis being Korsakoff's psychosis.

A mistake was probably made in the case in the first place in considering arterio-sclerotic brain disease without sufficient evidence of shock or with no residual focal symptoms of the same.

A brief recital of some of the opinions as to prognosis discloses a decided difference among the various writers. The leaning seems to be toward a bad prognosis and practically all have been unanimously guarded in their expressions.

Paton states that "certain writers hold that complete recovery sometimes takes place, an affirmation which I am at present unprepared either to accept or reject."

Hurd reported five cases with only two recoveries. In his monograph Hurd says he thinks "with persistent care and intelligent treatment, the prognosis may be made better than usually considered."

Stanley says in a recent paper "the prognosis is unfavorable. The disease rarely if ever terminates in complete recovery and may prove fatal in its early or later stages. The course is apt to be prolonged, resulting in the most favorable cases in more or less impairment of memory and emotional deterioration."

Kraepelin states "some patients recover after several months. Sometimes an incurable mental weakness is developed."

Other clinicians go so far as to say they have never seen a case of Korsakoff's psychosis make a complete recovery.

In the present series of cases it has been stated that 20 out of the 24 recovered. Most of them left the hospital and resumed their former occupations, to all appearances being in as good condition as before the psychosis. Of course, "if the persistence of some slight psychic defect" should make it necessary to call the case not cured, as Paton suggests, probably a majority of alcoholics would be so considered, as doubtless all have suffered some deterioration. One case remaining in the hospital is that of an old colored man with no friends to take care of him outside, but who is now in a normal mental condition. One of the 24 is still in a more or less delirious condition. Two of the three deaths could not be laid to the polyneuritic condition altogether, as one was caused by lobar pneumonia, the other by severe chronic nephritis.

In view of spinal fluid findings one may perhaps account for some cases of reported recovery of general paralysis by the possible fact that those cases were Korsakoff's psychosis in which lumbar puncture was not performed. And vice versa, some cases of Korsakoff's disease which failed to recover may have been general paralysis in which also lumbar puncture was neglected.

It is the writer's opinion, therefore, that the prognosis in polyneuritic delirium is generally better than has been stated in the books. It must be remembered the patients may die "during the delirium from some intercurrent complication" such as pneumonia or nephritis.

Active and careful nursing and general treatment will do much to improve the prognosis. Rest in bed is imperative and the prompt withdrawal of all alcohol indicated. A diet of milk and broths, plenty of water internally, remedies to stimulate the excretory organs, hot packs or warm baths if necessary for sedative and eliminative purposes, purgatives all have their routine uses. For profound toxæmia enteroclysis of normal salt solution is effective. The usual sedative remedies, *e. g.*, the bromides, chloral, etc., are to be used as indicated, as also the hypnotics trional, sulphonal and veronal. As the delirium passes away and

POLYNEURITIC DELIRIUM-KORSAKOFF'S PSY.

Case.	Sex.	Age.	Occupation.	Etiology.	Pupils.	Reflexes.	Nerve tendencies.	Speech and writing data.
T. C.....	M.	43	Farmer.....	Alcohol.....	Unequal.....	Much dim.....	Yes.....	Yes.....
J. C.....	M.	35	Bartender...	Alcohol.....	Normal.....	Much dim.....	Yes.....	Yes.....
M. McG...	M.	65	Miner.....	Alcohol.....	Sluggish.....	Fair reaction...	No.....	No.....
P. L.....	M.	68	Laborer.....	Alcohol.....	Contr., unequal.	Unequal.....	Yes.....	Yes.....
J. D.....	M.	55	Plasterer....	Alcohol.....	Reaction limited.	Dim.....	Yes.....	Yes.....
M. F.....	M.	60	Hotel keeper.	Alcohol.....	Reaction limited.	Increased.....	Yes.....	Yes.....
P. J. (col).	M.	56	Coachman...	Alcohol.....	Sluggish.....	Increased.....	Yes.....	Yes.....
E. W.....	M.	48	Candy maker.	Alcohol and trauma.	Unequal, sluggish.	Rt. dim.....	Yes.....	Yes.....
C. R.....	M.	54	Butcher.....	Alcohol and infection.	Unequal, sluggish.	Active.....	Yes.....	Yes.....
F. P.....	M.	32	Clerk.....	Alcohol.....	Sluggish.....	Active.....	Yes.....	Yes.....
Z. T. (col).	M.	49	Laborer.....	Alcohol.....	Active.....	Increased.....	Yes.....	Yes.....
N. A.....	M.	56	Motorman...	Bromide (?)....	Unequal, sluggish.	Absent.....	No.....	Yes.....
J. F. (col).	M.	33	Waiter.....	Alcohol.....	Active.....	Dim.....	Yes.....	Yes.....
L. T.....	M.	63	Carpenter...	Alcohol.....	Active.....	Increased.....	Yes.....	Yes.....
J. S.....	M.	49	Barber.....	Alcohol.....	Contracted....	Almost absent..	Yes.....	Yes.....
J. G.....	M.	42	Machinist...	Alcohol.....	Active.....	Absent.....	Yes.....	Yes.....
G. W.....	M.	30	Grocer.....	Alcohol.....	Active.....	Absent.....	Yes.....	Yes.....
J. M.....	M.	54	Laborer.....	Alcohol.....	Sluggish.....	Increased.....	Yes.....	Writing in...
E. F.....	F.	43	Housekeeper.	Alc. gastritis...	Active.....	Increased.....	Yes.....	Yes.....
E. L.....	F.	36	Housekeeper.	Alcohol.....	Active.....	Increased.....	No.....	Yes.....
C. K.....	F.	30	None.....	Alcohol.....	Active.....	Absent.....	Yes.....	Yes.....
S. P.....	F.	36	Housewife...	Following cur-retage.	Active.....	Absent.....	Yes.....	Yes.....
A. M.....	.	39	Housewife...	Grief, ill health.	No reaction to light.	Increased.....	Yes.....	Yes.....
M. W.....	F.	45	Waitress.....	Alcohol.....	Sluggish.....	Increased.....	Yes.....	Yes.....
E. D.....	F.	48	None.....	Chloral and bromide.	Sluggish.....	Increased.....	Yes.....	Yes.....

S. PSY. CHOSIS. W. C. SANDY, M. D., TRENTON, N. J.

Nerve tendencies.	Speech and writing defects.	Hallucinations.	Fabrications.	Disorientation.	Retention defect.	Amnesia.	Onset.	L. P.	Duration.	Results.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	3 weeks.....	.....	2 months.....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	1 week.....	.....	1 month.....	Rec.
No...	No..	Yes.	Yes.	Yes.	Yes.	Yes.	2 weeks.....	.....	8 months.....	Rec.
Yes...	Yes.	No..	Yes.	Yes.	Yes.	Yes.	6 or 7 weeks....	Negative.....	6 months.....	Rec.
Yes...	Yes.	No..	Yes.	Yes.	Yes.	Yes.	10 days.....	.....	.....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	3 weeks.....	Negative.....	3½ months....	Rec.
Yes...	Yes.	No..	Yes.	Yes.	Yes.	Yes.	3 weeks.....	.....	11 months....	Rec.
Yes...	Yes.	No..	Yes.	Yes.	Yes.	Yes.	2 weeks.....	.....	2 months.....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Sev. months (?)	.....	2½ months....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	7 weeks.....	.....	2½ months....	Rec.
Yes...	Yes.	.....	Yes.	Yes.	Yes.	Yes.	4 weeks.....	Positive (G. P.)	.....	Died.
No...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	10 weeks.....	Negative.....	6 months.....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	3 weeks.....	.....	1½ months....	Rec.
Yes...	Yes.	No..	Yes.	Yes.	Yes.	Yes.	4 weeks.....	.....	5 months.....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	3 months (?)	.....	4 months.....	Died. Lobar pneumonia.
Yes...	Yes (?)	Yes.	Yes.	Yes.	Yes.	Yes.	2 weeks.....	.....	Still in hosp..	
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	3 weeks.....	Negative.....	2 months.....	Rec.
Yes...	Writing	No..	Yes.	Yes.	Yes.	Yes.	3 weeks.....	.....	3 months.....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	5 weeks.....	.....	3 months.....	Rec.
No...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	3 weeks.....	.....	3 months.....	Rec.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	4 months.....	Negative.....	6 months.....	Died.
Yes...	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	10 weeks.....	Negative.....	4 months.....	Died. Chronic nephritis.
Yes..	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	3 months.....	.....	3 months.....	Rec.
Yes..	Yes.	No..	No..	Yes.	Yes.	Yes.	4 weeks.....	.....	3 months.....	Rec.
Yes..	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	5 weeks.....	.....	2 months.....	Rec.

if there is much heart weakness during the active delirium the stimulative effect of strychnine and digitalis is beneficial.

During convalescence, massage and passive motion are necessary to overcome the effects of the neuritis. Daily suggestion and correction of the patient's false ideas are useful in hastening the restoration of his mental equilibrium.

In conclusion, there is no doubt in the writer's mind that Korsakoff's psychosis is a distinct entity, at least from an alcoholic standpoint.

It must be admitted, however, that the symptom complex, *i. e.* memory disturbances and fabrications, is seen in other conditions, but an analysis of the cases should usually serve to differentiate such conditions. Again, it has been shown that Korsakoff's psychosis may be present in combination with some other more chronic and lasting disease.

The prognosis would seem to be more favorable than usually stated.

A BRIEF REPORT OF TWO INTERESTING CASES OF MELANCHOLIA.*

By C. A. PORTEOUS, M. D., MONTREAL, CAN.

The two cases of melancholia described in this report are of more than ordinary interest mainly from their unusually lengthy duration followed by recovery without any evidence of dementia; from the psychic negativism shown so prominently in both, particularly in the case of the woman; and by reason of the late age when recovery occurred after the chronicity which had been established in the disorder.

CASE I.—H. T., male, æt. 47, admitted to Verdun Hospital May 18, 1897. Married 17 years, has four children. Nativity, England. Parents dead. Occupation, accountant; higher education, having studied and passed examination for the degree in surgery in London, Eng., though he never practiced. Heredity: A history of "nervousness" in mother and one maternal cousin, also maternal uncle. This is the first attack and began one month before admission to hospital; patient always spoken of as slightly eccentric. Moderate user of tobacco and spirits; reported to have had one syncopal attack, epileptiform in character about the age of thirty, none observed since. Has during the past month become depressed, unable to work, says he is ruined, is semi-confused, refuses to eat when anyone else is present; will not undress. (Recently his salary was reduced by 50 per cent., and this is stated as an exciting cause.) Frequently mute, wanders off about wharves of city; has expressed wish to sit on railroad track.

Examination on admission shows man of small stature, fairly well nourished, keen searching glance, worried expression. Physical examination negative. May 18: Appetite good; sleeps well; will not answer when spoken to and repels any efforts made to engage him in conversation; occasionally, if pressed, will answer in monosyllables. May 19: To questions of examining physician anent his health says he is perfectly well; is silent when asked to explain his strange conduct at home; fundamental mood one of depression. June 2: Depressed and agitated because he states he has no funds to meet his maintenance here and asks to be allowed to leave; refused to go out to do light work in the carpenter shop. Patient's condition remained one of depression until the end of July, although occasionally he could be induced to go to the carpenter shop where, however, he took but little interest in what

*Read at the sixty-eighth annual meeting of the American Medico-Psychological Association, Atlantic City, N. J., May 28-31, 1912.

went on and seemed incapable of doing any but the simplest work. August 1: Sent for physician and told him, in great anxiety, that he was dying from a leakage of semen into his bladder and that he was impotent; insisted on having his scrotum examined, which was normal, but when questioned about his delusion, answered irrelevantly and could not be persuaded to explain or discuss this delusion. August 2: Not eating, says he is not fit to live. August 13: Has delusion his "insides are all absorbed"; states he cannot any more discriminate between right and wrong.

During the summer of this year patient continued depressed, hypochondriacal, seldom or never speaking voluntarily. In October became very sleepless, pacing floor at night and it was reported by other patients that he at times mentioned self-destruction; at this time he seemed more than usually stuporous, showing motor as well as psychic negativism. During January, 1898, acted constantly as if in great fear, but all efforts to draw his delusions from him were unavailing; is now, however, sleeping better and general physical health is up to par.

Throughout the years 1899 to 1903, inclusive, he remained in *statu quo*; he was fairly cleanly, though objected to washing in mornings or bathing; quiet; mildly depressed; mute; avoided others; passively resisted attempts to get him outdoors, often holding a newspaper in front of him, usually upside down, probably in the hope he would not be interrupted if engaged in reading; he attended entertainments but manifested no pleasure or interest therein; dressed himself, and conformed, as a whole, to hospital routine readily.

During 1904 and 1905 he continued the same quiet, inoffensive case, except that in August he violently attacked another patient near him, without any apparent cause; this was probably a reaction to some hallucinatory state, though such could not be definitely determined; for a few days after this he seemed stuporous, restless at night and took little food. Soon again he resumed his former quiet mode of daily life. During the years 1906 to 1909, inclusive, he continued in much the same state already described as obtaining from 1899 to 1903; he was now judged to be demented and to offer little or no likelihood of improvement.

In June, 1910, he had a mild attack of coryza and bronchitis attended by a moderate rise in temperature which lasted for a few days; soon after this he seemed brighter, suddenly developed some interest in external affairs and began to speak to the physicians and attendants in a rational manner; at this time his physical condition showed improvement. He was recommended to go out daily and work with the gardener and about the middle of July readily assented. A fortnight later his wife and daughter were sent for owing to the evident improvement in his mental condition, but he objected to seeing them; he gave as his reason, that "he had no desire to renew old acquaintances," he also showed some restlessness after their departure.

From this time on his improvement steadily became more pronounced, his depression disappeared, he took a lively interest in all affairs going on

about him, read periodicals and newspapers eagerly and gained in weight. He was soon permitted to go alone to visit his friends in Montreal for the day, and on October 18, just thirteen years and five months from the date of his admission, he was allowed to go on parole to his relatives. Shortly after this, occupation as book-keeper was procured for him with the same corporation that had formerly employed him; there he remained, doing his work satisfactorily until early in November, 1911, almost a year after his discharge from hospital, when he died suddenly on the way home from his work one evening, cardiac syncope being the cause. No hint of any depression or return of the mental symptoms was noticeable during his sojourn at home. At the time of his discharge he was sixty years of age.

CASE II.—I. N., female, *æt.* 51, admitted to Verdun Hospital November 9, 1903. Married 16 years, has four children. Nativity, Germany, Jewish. Parents dead. Merchant's wife; fair education. Heredity, both direct and collateral, denied. This is first attack and began six months before admission to hospital; patient always considered as normal; as a girl, and even to maturity, however, would allow her sisters to impose upon her by allotting work to her which rightly she could have refused, but which, while secretly objecting to, she did without open demur. Attack first showed itself by depression, delusions that her family no longer wanted her or cared for her; suicidal propensities manifested early, one attempt at self-destruction being made by choking herself with a handkerchief. (Her husband's failure to support her and his ultimate desertion of her and their children is quoted as the exciting cause of the mental disease.)

Examination on admission shows woman of medium height, spare but fairly strong and active. Face is indicative of depression but this is not extreme in degree; talks quietly about herself, betraying no evidence of delusions at interview; speaks of her husband's desertion four years previously but does so in an unemotional manner. Memory for recent and long past events good. Physical examination negative. November 10: Slept well; quiet, agreeable and pleasant when approached; asking for work to do, willingly went walking, attended entertainment. November 11: Sleeping well, taking nourishment well. November 15: Nothing noteworthy save simple depression; not taking food as well to-day. November 16: Wakeful at 3.40 a. m., saying she could not sleep; during day was restless and irritable, often crying. Slept a little during day. November 18: Restless during night, delusional, imagined charges were being laid against her. November 20: Insomnia marked, says she is the cause of other patients being noisy; asking to be taken to prison; not eating. November 23: Has grown more agitated and depressed, and to-day required artificial feeding. November 25: Shows negativism, has to be forced into dining-room, and resists taking meals. In December the depression deepened and she showed marked motor agitation, frequently pacing ward, crying out, "Oh what made me do it"; sleeping very poorly. When visited by relatives ignores them completely.

During January, 1904, continued in a state of depression and fear, frequently restless and repeating, "I never did it," or "Nothing can be done." Now refuses to go to bed, or, if she does do so, soon gets up and stands behind the door; failing in weight. During February showed no improvement, her mental agony now expressed by moaning and muttering to herself; motor negativism apparent. In March patient remained in much the same condition except she became mute as far as hospital staff were concerned and also failed to respond to any questions put to her by her brother when he visited her. For the remaining months of the year 1904 few or no new symptoms developed; patient remained depressed, mute; at all times showed a moderate grade of negativism and while sleeping fairly, frequently was induced to take nourishment only with great difficulty; she continued cleanly in habits.

Early in 1905 was visited by her son but would not speak to him or give any sign that she recognized him or was pleased with his visit; about June of this year, however, the negativism lessened somewhat and although she would not speak she began to help with work in the dining-room of her ward; during a visit from her son in July she became excited in manner and restless but would not answer him when spoken to; this slight change for the better, as indicated by her voluntarily assuming certain duties in the dining-room, lasted until mid-summer of 1906, when she relapsed into her former condition of semi-stupor and abandoned any attempt to do simple work.

From this time onward for over five years, that is until the end of 1911, patient remained quiet and depressed, the degree of passive resistance varying from time to time although always present. She remained absolutely silent, but evidently understood what was said to her, as shown by her following certain simple directions during her less stuporous periods; her general physical health remained up to the average in spite of her inactive habits, her appetite was good and she slept well; no sign of uncleanness in personal habits was evidenced throughout this long period.

In February, 1912, she developed an attack of subacute articular rheumatism, attended by some pain and swelling first of wrist, then ankles, and it was noticed during the daily examinations made that she seemed much interested in any directions given for her treatment, her glance grew more intelligent, when asked to move in bed she would do so readily, and in other respects would follow out what was recommended to her as being likely to be of benefit; after a few days when asked a question she would nod or shake her head to give affirmation or denial. She became convalescent from the rheumatic attack by the last week in March, and maintained the improvement noticeable in her mentality, soon began writing notes to express her wishes, and letters to her relatives, all well written and clearly expressed. By April 11, as nothing irrational in her behavior or letters was noticed, her relatives were recommended to take her home, in the hope that the change might be of assistance in overcoming her now peculiar silence; to all questions as to why she did not speak she would simply write, "I cannot do so."

Patient after reaching home continued silent for several days, indicating her desires and requirements quite intelligently by writing; she carried a pad and pencil about with her for the purpose. Her conduct, except in the matter of speaking, was rational in every respect, personal cleanliness being scrupulously observed; she showed a quite normal interest and affection for her brother and his family with whom she was domiciled. One of the leading laryngologists was consulted, but the most careful examination showed nothing wrong with the organs of speech.

Speech was reestablished suddenly during a paroxysmal attack of coughing brought on during the night, owing to the passage of mucous from the back of the nares into the throat; her first words were, "I can't, I can't," to her brother who, hearing her coughing severely, came to her room; she was sitting up in bed, and evidently spoke in the effort to procure aid for the suffocating sensation which assailed her. There is little doubt that the abrupt and insistent influence of fear was the force which overcame this strange mutism, which had now lasted for slightly more than eight years. During the morning following her fit of coughing, which simple measures wholly relieved, she voluntarily but hesitatingly spoke her brother's name, then, on request, the names of other members of the family. This, at first, was done in halting fashion, but distinctly. Guided and urged, she then said phrases simple in character, but with some hesitation. As the efforts to induce her to speak were persisted in throughout the day, she gradually responded more willingly, and articulated more distinctly, hourly showing a return of confidence in herself and in her ability to answer and talk. The day following she talked more or less constantly, but rationally, mostly referring to events that had occurred before her illness. Since that time she has been normal in every respect. She remembers much that took place while in hospital, except for the first three months after admission, and for the month immediately preceding her admission to hospital; these periods remain practically a blank. The patient's age on discharge was 59.

DR. ELI TODD AND THE HARTFORD RETREAT.

By CHARLES WHITNEY PAGE.

In the year 1715 the General Assembly of the State of Connecticut revised the public statutes, one act of which reads as follows:

When and so often as it shall happen to any person to be naturally wanting of understanding, so as to be incapable to provide for him, or her, self; or by the Providence of God, shall fall into distraction and become *non compos mentis*, and no relative appear that will undertake the care of providing for them, or that stands in so near a degree as that by law they may be compelled thereto; in such cases the selectmen or overseers of the poor of the town, or peculiar where such person was born, or is by law an inhabitant, be and hereby are empowered and required to take effectual care, and make necessary provision for their relief, support and safety of such impotent or distracted person, etc., etc.

For the next century, in the State of Connecticut, no more direct or specific laws regarding the insane were enacted. Meantime any surroundings, however unfitted, cramped and forbidding; any devices, however galling and cruel, deemed by ignorant or inexperienced relatives as proper measures for confining or restraining the insane, were adopted, without exciting public protests or more than passing interest, with those exceptional instances where attending physicians had had their sympathies engaged by observing the unnecessary hardships frequently imposed upon neglected or abused cases.

In 1812 Dr. Nathan Dwight, of Colchester, wrote a paper reciting existing conditions and suggesting the need of a public hospital for the insane.

His paper was read at the State Medical Convention and as a result a committee, with Dr. M. F. Cogswell as chairman, was appointed to obtain further information and report to the next annual Convention.

In 1813 this committee, having made little progress, was authorized to continue its investigations. Probably it then accomplished nothing as in 1814 the State Medical Society appointed Drs. Cogswell and Strong a committee to ascertain the number of insane in the state.

They requested the Association of Congregational Clergymen, which Society had members residing in every town, to supply the facts. It was supposed that every community in the state could thus be canvassed by a local agent, familiar with actual conditions. Yet the report which came through the clergymen was obviously incorrect and the subject received no further consideration by the Society until after the lapse of several years.

But Connecticut physicians were too deeply concerned in the unfortunate insane to abandon efforts in their behalf.

At the spring meeting of the Hartford County Medical Society, in 1821, the subject was again introduced, and this time by men who had carefully studied it and who were ready to suggest practical methods by which to solve the various problems involved.

Action resulted and the fellows were instructed to bring this matter of the insane before the State Convention at its next meeting in May. This was done, and as a result the State Medical Society appointed Drs. Eli Todd, Thomas Miner and Samuel B. Woodward a committee to formulate a working proposition for the Society.

Todd, then living in Hartford, was evidently the original promoter of this movement in the County Society. He was ably supported, however, by Dr. Woodward, who resided in Wethersfield.

It appears that Todd had become thoroughly informed as to the usual, and the exceptional, methods then in vogue for treating the insane; and having convinced himself that very recent improvements in an English asylum marked a great advance, he resolved that the State of Connecticut should be provided at once with a central asylum, where the more rational methods of care could be employed to improve the condition of the insane.

These two men, general practitioners of medicine, were remarkable for their intellectual poise, their practical sense and their executive ability. Both were destined to work out, here in New England, practical reforms in managing the insane. By their personal service in the cause, and their published reports, they virtually molded and directed for many years, in this section of the country, professional opinions regarding the custody and proper treatment of the insane.

Moreover, the methods of hospital management which these two Connecticut men subsequently inaugurated, Dr. Todd at the Hart-

ford Retreat, and Dr. Woodward at the Worcester State Hospital, accorded with institutional standards which are and will ever remain, pre-eminent, in respect of humane consideration and the skillful employment of moral agencies. When therefore the medical convention deferred to the judgment of these men, its action was well considered. The committee quickly reported that "immediate work to secure an asylum for the insane ought to be instituted. Whereupon, the State Society added Drs. William Tully and George Sumner to this committee, and instructed its members to proceed in the undertaking and formulate 'a constitution for the regulation of the government' of such an asylum."

The importance and urgency of this humane departure in the care of Connecticut insane so strongly appealed to those kind-hearted and clear-headed doctors, that the committee was requested to report at an adjourned session to be held for that purpose on the 3d day of the ensuing October. On the day appointed, the convention re-assembled and listened to the report of the committee. This report was such a masterly presentation of the cause, showing such complete insight as regarded actual conditions which confronted them, and such comprehensive knowledge of what had been attempted elsewhere, and what could be done in the way of bettering the conditions of the insane, that copious extracts from it are necessary to do simple justice to the author—Dr. Todd, in all probability. It states:

It appears that in 70 towns there are somewhat more than 500 cases of insanity. Fifty-four towns remain to be heard from; and should the disorder be found equally prevalent in them, the entire number in the State will scarcely fall short of 1000.

Their situation is wretched in the extreme. The victims of moody melancholy constitute a class of beings enslaved by the phantoms of their own imagination—phantoms which hover around their dwelling and pursue them in their customary rambles. As they enter a home endeared to them by many a fond recollection, the anxious countenances of a family once lightened by the rays of cheerfulness and hope, serve to depress hearts already overloaded with sorrow.

In their whole intercourse with society, their spirits are wounded by a sneer or a jest. . . . The force of their disease is augmented from day to day, and at last suicide or confirmed insanity is the result of accumulated, though imaginary insanity. . . . But the poor maniac doomed to confinement in the lonely dungeon, and often to wear chains which should be reserved for guilt alone, claims our intercession and sympathy. In

most cases he retains mind enough to see that he is an outcast from society, or associated with its most infamous members. Thus situated, and retaining a consciousness of his own innocence, he feels he is injured and abused. . . .

The wretchedness of those families upon which devolves the care and maintenance of the insane can be estimated only by those who from personal observation have become acquainted with its extent. We infer that while the causes which have been enumerated continue to operate, mental alienation will continue to prevail, and in private practice no disorder is more unmanageable.

The patient suffers from want of that steady course of discipline which is equally removed from cruelty and indulgence. . . . It often happens that the character and "rank" of the patient prohibit the use of those salutary measures, which in a public institution might be pursued.

Is he the master of a family? The recollection of his former ascendancy, and the idea of his personal rights, will cling to him until he is removed from the dwelling over which he claims control. Is he a child? Accustomed to indulgence, he brooks no restraint, but reproaches for their cruelty all who oppose his ungoverned passion. A madman in his own house is, of all situations, the worst. . . .

Painful, indeed, would have been the duty assigned us, if, after investigating the extent of this evil, we had seen no prospect of its diminution. But when we turn our attention towards an asylum established on humane principles, and presenting to the unfortunate sufferers who enter its portals, all that ingenuity can suggest or benevolence bestow for the cure of their disorder; that cheering prospect is ours.

Such an asylum should be the reverse of everything which usually enters into our conception of a mad-house. It should not be a jail in which, for individual and public security, unfortunate maniacs are confined; neither should it be a hospital merely, where they may have the benefit of medical treatment,—for without moral management, the most judicious course of medication is rarely successful. . . .

At the present time, it is not to be expected that we should do more than barely sketch the outlines of a place which may hereafter be modified by circumstances and matured by reflection.

If the unanimous opinion of the committee receives the sanction of the convention, the first step will be to make the public acquainted with the value and need of the contemplated asylum. And when that is once effected, we doubt not but it will find an advocate and a patron in every friend of the public welfare. . . . Much will depend upon the judicious choice of medical and domestic attendants. . . .

Our aim will be to guard against abuses, . . . and we shall call upon those to whom the insane are to be entrusted, to act with deliberation and prudence. The friends of the unhappy patients must be assured that no efforts will be wanting to correct the delusions and arouse the dormant energies of the mind diseased. They must be assured that the inmates of

this asylum will in all cases be treated with humanity, subject to no unnecessary rigors of discipline, and controlled by no force unless their personal safety requires it. The chains and the scourge, which have too often been the implements of coercion, must be abolished, and every attendant dismissed from the institution who resorts to violence in the performance of his ordinary duties.

The history and ceremony of the Retreat established by the Society of Friends in the neighborhood of York, England, may be consulted with pleasure and profit. It furnishes a lucid view of the effect of moral management, and teaches how much may be effected by the perseverance and the charity of the few. For many years that asylum excited little attention, and received as little patronage; but it now has assumed its pre-eminent rank, to which, from its superior regulation, it is justly entitled. Its managers appear, however, to have placed too little reliance upon the efficacy of medicine in the treatment of insanity.

In ancient Egypt, the insane were conducted to those temples in which were collected whatever seemed calculated to please the eye and rivet the attention. There, as they wandered from one magnificent object to another, the world and its vexations were forgotten, and amid the deep interests of the scene, the gloomy images which haunted them were banished from the mind.

In Greece, on the other hand, the followers of Hippocrates relied exclusively on the specific power of hellebore and its adjuvants, medicines which at this day are rarely employed.

Among the improvements of modern science must be ranked the co-operation of these two modes of practice. . . . In the contemplated asylum, many whose cases are now deemed hopeless would regain their reason. Many a wandering maniac might have been restored to health, if, at the commencement of his disorder, he had been placed in such an institution. On this subject, however, we wish no one to rely on the bare assertion of the committee, and appeal to statements, the truth of which cannot be doubted, to prove the justness of these observations. Dr. Willis, in his evidence before the Parliament of England, stated that nine out of ten cases recovered if placed under his care within three months of the attack. In the great French hospital over which Pinel so ably presided, the records present the same flattering results. And in the extensive practice of Dr. Burrows, the proportion of cures has been still greater. What has been the experience of physicians in this State, we leave for others to decide; but excepting cases of delirium which occur in febrile and other disorders, it is feared that a large proportion of the insane never regain their reason. . . .

As Christians, and as men, it is our duty to alleviate the sufferings of others, as physicians it is also our imperative duty to use every exertion for the improvement of insanity. No one conversant with the records of our profession can hesitate for a moment to believe that its interests would be greatly promoted by adopting the plan we have suggested. . . .

With this view of the subject we conclude, believing that the convention will take immediate measures for the formation of a Society for the Relief of the Insane.

It was reported that Dr. Todd's graphic description of the suffering and neglected insane and his confident prediction of radical improvements in their lot, with a brilliant record of recoveries, if only the members of the State Medical Society would earnestly work together for such ends, deeply moved his auditors, many of whom actually shed tears.

How well considered, and how very advanced, were these theories pertaining to the care and treatment of the insane, can be fully appreciated only as they are contrasted with the general ignorance and apathy on this subject, which at that time almost universally prevailed. There was a degree of public indifference, at least, concerning the mentally afflicted which entailed common neglect and almost as common abuse of the innocent victims of this deprecated disease.

What the insane suffered in former times is too widely understood to require a re-statement of the too abundant facts on record.

That the Connecticut physicians derived their inspiration and warrant from European sources, is evident from passages in their brief which has been quoted. But the bright picture they painted must have come from isolated examples.

The only act of the English Parliament before 1808 which bore upon the care and protection of the lunatic poor, was the law of 1744; and that authorized "any two justices to apprehend those who are so distracted in their senses that they may be too dangerous to be permitted to go at large and have them securely locked up and chained."

In 1806 Parliament appointed a committee instructed to "inquire into the state of pauper lunatics," but no legislation followed.

In 1807 Sir George Paul stated:

Of all the lunatics in the kingdom, not one-half are under any kind of protection from ill treatment, or placed in a situation to be relieved of their malady.

But shocking revelations in regard to asylum abuses, which became public about 1815, so disturbed public sentiment that in 1816 Parliament did enact a law "For the better care of the pauper insane." This act, however, delegated insufficient power and

authority to the commissioners to effect any radical elimination of existing abuses.

It was not until 1844, twenty years after the Hartford Retreat was founded, that England gave to its Lunacy Commission the authority and support necessary to correct faults and abolish abuses in the treatment of all classes of the insane. Meantime private mad-houses, scattered throughout the land, had no doubt been guilty of the greatest injustice toward the insane.

Complaints against such proprietary establishments reached Parliament from time to time, and in 1773 a bill "For the regulation of private mad-houses" was submitted, but did not become the law. In 1774 a bill directing the authorities to issue a license for a private mad-house "to all persons desiring it," was passed. The English government had been slow in providing special institutions for the insane, consequently many money-making private hospitals flourished. The reputations of such places become such that there arose a strong public sentiment favoring the establishment of larger semi-public, incorporated asylums for the accommodation of the insane. An institution of this class, named the York County Asylum was founded upon a charitable basis in 1776 in the city of York. Its reputation was equal to that enjoyed by the best of its class, when in 1791 "the friends of a patient who was confined there were refused admission under circumstances which aroused suspicions, and with only too much reason as events proved." This sad instance of "man's inhumanity to man" became a landmark in the history of insanity. The unfortunate victim was a member of the Society of Friends; and the indignity and cruelty inflicted on that patient so wrought upon the sympathy of the Quaker leaders, that they determined to provide for their own insane an asylum, the affairs of which they could wholly control—a fitting place of detention where the Quaker theory of life and duty—the spirit of the Golden Rule, interpreted by the Quaker intelligence and faithfulness—could accomplish its perfect work in caring for the insane. This was a most important starting-point for modern methods of humane treatment of the insane, especially in English-speaking countries.

It is true that Pinel, in France was at that time treating the insane along similar lines, and in the following year, 1792, he characterized the new era for the insane by a wholesale removal

of chains from supposedly dangerous maniacs in a Paris hospital. But the political troubles of that country, at that period, so obscured individual efforts for the uplift of humanity, that Pinel's work was not generally understood and appreciated until considerable time had elapsed. The York Quakers did not learn the facts concerning Pinel's masterly stroke until 1806, therefore their conception of a home for the insane was wholly without precedent so far as they had knowledge upon the subject.

The acknowledged leader of this movement, to establish the York Retreat, was William Tuke, who represented a family which for several generations had conducted in York a wholesale tea and coffee business. He, with several others, began collecting funds for an asylum in 1792; but the building with accommodations for sixty patients was not completed until 1796.

The Quakers were unwilling to call their philanthropic project an asylum, because that word had become associated in their minds with too much that was painful and forbidding. For a time they were much concerned over this matter, when finally Tuke's daughter-in-law, Mrs. Henry Tuke, suggested the very appropriate name "Retreat," which they readily adopted, deeming this happy solution of their perplexity an augury of future success.

In this hospital of original ideas—the York Retreat—not only were the long-time hardships and abuses, which the insane had hitherto received, eliminated, but medical treatment was in its early days almost ignored. A retired physician, Tuke's brother-in-law, assisted him for two months when patients were first admitted. But after his death Tuke was in absolute charge for a year or more, until he secured the services of another layman, Mr. Jepson, who became an excellent manager in time under Tuke's oversight. It is probable that York physicians were brought in to treat patients who developed symptoms of acute, obstinate disease, but no resident physician or medical superintendent was officially connected with the York Retreat in its early history.

The consequences of this unusual hospital arrangement were momentous. At a stroke, quietly and innocently dictated, traditional modes for caring for the insane—the routine, undesirable hospital practices, and pernicious personal experience with the old order, were simply blotted out. Had a recognized physician

been employed to manage the York Retreat, the authority of the schools and the fancied dignity of the profession would have dwarfed, in his mind, the utility of those simple, practical, humane measures, clever devices and social arts which were depended upon to control and regulate the lives of his insane wards.

The open-minded, non-professional, Tuke administered mild domestic remedies and the warm bath. He learned that tonics and a liberal diet promoted cheerful spirits as they improved the bodily health. He antidoted inclinations to turbulent conduct by providing regular employment for his patients and mitigated insomnia by giving them hearty meat suppers with a liberal supply of porter. He planned agreeable occupations—something to engage the mind while exercising the body: such as gardening, household duties, riding, walking, sewing, embroidery, reading, singing, games, instrumental music, etc., all to be performed with order and regularity, even to dining-room habits, retiring at night and rising in the morning, thus enforcing a mild but salutary discipline. "He acted upon the theory that self-esteem on the part of the patient was more potent than threats and appeals to fear." To successfully control patients through such inducements, every incident of the day required constant attention, with unwavering kindness on the part of the attendant or nurse, and a judicious oversight on the part of the management.

Thus Tuke evolved his system of treatment—a mode of caring for the insane which wonderfully ameliorated the worst features of the disease, and convinced unprejudiced observers that even the cure of insanity in many cases depended more upon humane, than medical, agencies. In the process of time this dependence upon moral influences in the care of the insane came to be discussed and referred to as "the moral treatment of the insane."

Once started on its noble career, the York Retreat went quietly about its humane work attracting but little local attention. Meantime it was visited by a number of discerning foreigners, who were deeply impressed by the absence of ordinary asylum features, the unexpected quiet and the family atmosphere, which pervaded the institution. As a result, several laudatory articles appeared in foreign publications. Dr. Ferrus, physician to Napoleon I, wrote that it was "the first asylum in England which arrested the attention of foreigners." He extolled "the home-like arrange-

ments" and the "moral treatment" which Tuke had conceived and was testing out; "the abolition of unnecessary restraint; the absence of irksome discipline; the quiet and orderly disposition of the place, and the evident value of industrial employment."

Dr. Delarine, a Swiss physician, commented enthusiastically concerning the institution after a visit of inspection. He compared it to "an ordinary farm colony"; and expressed surprise that "the house had no window bars or gratings." It was through this Swiss doctor that Pinel, in 1797, first heard of Tuke's enterprise in York.

After the York Retreat had been in successful operation for a dozen or more years, Samuel Tuke, a son of William, published several articles claiming that "the institution had demonstrated the beneficial results of humane ideas consistently applied to the treatment of insanity." In 1813 he published in book form a "Description of the York Retreat," which served to spread its reputation and fame. This book, with its novel claims, naturally attracted marked attention. It provoked discussion and aroused serious-minded hospital managers. Thus by direct and indirect means it accomplished great good, marking the beginning of better treatment of the insane in civilized nations.

A lengthy notice, of this book, written by Sydney Smith, was published in the *Edinburgh Review*, in April, 1814. The writer observed that "the Society of Friends seemed to consult the interests of the patients rather than those of the keepers"; that "the superintendent preferred to run some risk rather than use restraint"; that "he placed little dependence upon medicine alone for the cure of insanity," but "very frequently employed the warm bath with the happiest results"; and concluded that "upon the whole, we have little doubt that this is the best managed asylum for the insane that has ever been established and part of the explanation no doubt is, that the Quakers take more pains than other people, with their insane."

But this "Description of York Retreat" received few such appreciative notices, and it met with some hostility and detraction.

Willful and malicious misrepresentations of the Retreat and its internal affairs were freely circulated. The head physician of the neighboring York County Asylum anonymously published, in a local paper, most bitter and unfounded attacks.

Eventually these libelous publications so aroused the non-combatting Quakers, that William Tuke decided to expose conditions in the county asylum, the abode of his most annoying enemies. Conforming to the plan of foundation, a number of Quakers became members of the governing board through liberal subscriptions. They soon made a searching investigation, and the revelations, shocking beyond the expectation of Tuke and his friends, checked open calumny of the Retreat, and awakened a widespread public interest on this subject.

But unfortunately for the insane, there persisted, in official circles especially, much opposition to Retreat methods, due to tradition, erroneous ideas of expediency, and official indifference. On the whole, however, an enlightened public opinion gradually brought about many favorable modifications in asylum practice, though it was many years before the insane in confinement were emancipated from unnecessary restrictions and grievous cruelties.

At the time when Dr. Todd, in Connecticut, was giving such glowing accounts of the Quaker system of moral management, English physicians as a rule were either skeptical or neutral regarding its advantage or feasibility. No asylum in England had openly adopted Tuke's views, and excepting the practice of Pinel in Paris, the York Retreat was the only known public institution for the insane where such radical but mild methods of treatment were systematically enforced.

There can be little question as to the source from which Dr. Todd and his medical associates derived their ideas upon the subject of hospital treatment for the insane, since they adopted the very name "Retreat," and copied, even to details, the organization in York. The formation of a society of contributors, and ranking them in accordance with the sum each subscribed, was the English plan embodied and transplanted. There is no record that any of those Connecticut physicians had visited York. But without doubt they had studied and mastered Samuel Tuke's "Description of the York Retreat," one edition of which was published in Philadelphia in 1814.

To have passed over the many prominent asylums for insane, which then existed in America and England, and to have accepted as their pattern the exceptional York Retreat, conspicuous for its

humane Christian treatment of the insane ; to have informed themselves so wisely and thoroughly ; and to have become so enthusiastic regarding the Quaker theories, so far in advance of those times, evinced their discriminating judgment and philanthropic zeal.

Thus equipped for the important task before them, Todd and his co-workers strove diligently to secure a Connecticut Retreat ; and with a degree of assurance that overcame opposition, and a spirit of enthusiasm that actuated a wide circle of interested citizens.

The subscription committee of the Connecticut Medical Society met at New Haven in May, 1822, and found that \$12,000 had been pledged. To this sum the State Medical Convention soon after added \$600, all the available funds then in its treasury.

During the same month a memorial was addressed to the General Assembly, then in session, praying for a charter, which would legalize their organization, and confer power to purchase the necessary land, build and maintain an asylum for the treatment and custody of insane patients.

Having previously considered, at some length, the committee report presented by Dr. Todd to the State Medical Society, and its stirring effects upon that usually sedate body, it can be imagined with what command of relevant facts, with what logic and pathos Todd, and his aides in that human enterprise, appealed to the committee of the legislature.

When Todd was impelled by a sense of justice he could phrase brilliant and persuasive figures of speech.

Referring to Todd's rare oratorical endowments, the late Henry Barnard, LL. D., Hartford's noted educator, wrote :

No man of my recollection, and I have in my life time been thrown with many of the foremost men of the world, so impressed me as a public speaker.

Evidently the speakers for the Connecticut Medical Society acquitted themselves with credit, for the desired charter was immediately granted.

But that instrument, important as it was, is not the only document extant to prove that those devoted physicians offered brilliant and convincing arguments ; that they disclosed ample grounds of assurance for the faith which kindled and sustained their en-

thusiasm regarding the improvements possible for the insane in the state.

The joint resolution, relative to the act of incorporation, is a state paper which merits reproduction in this historical review, since it abounds with spontaneous evidence that these earnest, well-informed doctors had fully persuaded the law-makers of the state that, at length, the most perplexing problems associated with insanity were clearly comprehended, and that the proposed solution would fulfil their expectations. In fact, the committee of the legislature was so completely captivated by the doctors and their proposition, that its members seemed to vie with the medical committee in promoting this exceptionally important measure, so replete with promise of public good.

Their unique resolution reads as follows:

The Joint Committee to whom was referred the Petition of Thomas Hubbard, and others, on the subject of the establishment of an asylum, or Retreat, for the Insane in this State, praying for an act of incorporation; respectfully report that they have inquired into the truth of the facts as stated in said Petition, and find that in May, 1821, the Connecticut Medical Convention appointed a committee to ascertain the number of insane persons within the State of Connecticut, and made report thereon to said convention in October, 1821, when it appeared that there were in this State more than 1000 persons suffering under the disease of insanity. The Medical Convention thereupon appointed committees to solicit donations for the purpose of purchasing lands and erecting buildings for the proposed asylum, for which benevolent object more than twelve thousand dollars has been subscribed. The Committee further find that the members of said Medical Convention have made almost unexampled exertions to promote the objects of said asylum, and have besides most liberally appropriated therefor, the whole of their funds, amounting to six hundred dollars.

It has also been proved to the Committee, by the statement of physicians of high respectability, the truth and the correctness of which the Committee cannot doubt, that very important and valuable discoveries and improvements have been made in Europe, particularly in England and France, in the art of curing and relieving the insane in regard to both medical and moral management, and that mildness of treatment has been most successfully substituted for chains and violent restraint, and that upon an average, 91 in 100 cases of recent insanity are treated successfully, and that out of 100 old cases, generally deemed helpless, 35 of those unfortunate persons have been restored to health; to their friends and to society. To produce such desirable results, it is indispensably necessary that a Retreat should be provided for the sufferers under this grievous and terrible calamity, where they may remain under the constant super-

vision of professional gentlemen of skill and experience in the modern and approved mode of treatment and cure.

It is the avowed, and in the opinion of this Committee, the fixed and sincere, intention of the Petitioners, to introduce into this State the modern improvements and discoveries above referred to, and to admit into the asylum, the indigent as well as the rich, upon moderate and reasonable terms.

For which laudable intention, and for the persevering efforts already made by them to carry it into effect, the members of said (Medical) Commission are richly entitled to the thanks and gratitude of their fellow-citizens.

Notwithstanding the enterprise and the extraordinary zeal and liberality of the projectors and patrons of this humane institution to promote its interests, it is feared by the Committee that without the aid and patronage of the General Assembly it may droop or totally fail of success. But the Committee have good reason to believe that with such aid and patronage it would soon become an institution of great public utility, honorable to the character of the State, and to the cause of humanity.

Strongly impressed with these considerations, the Committee recommend a special grant on said Petition, viz.: That the petitioners and such others as they may associate with them, be made and constituted a body politic by the name of The President and Directors of the Retreat for the Insane; that \$5,000 be granted to said institution from the public funds, payable whenever, if within two years, \$15,000, exclusive of this grant, shall have been subscribed, and \$10,000 thereof actually paid to the treasurer of said corporation for the benefit thereof, and that the Governor be authorized to grant a brief for five years, one a year, soliciting contributions for the benefit of said institution.

(Signed.) AUSTIN OLCOTT.

The charter granted embraced the recommendations of the committee and the general specifications included in the petition. The plan of organization was copied from English precedents. Some of the details were as follows:

This Society shall be comprised of those subscribers whose benefactions shall amount to either of the subsequent sums: Those who pay \$20 shall be members for life. Those who pay \$12 shall be members for 10 years. Those who pay \$2 shall be members of the Society, and shall be required to pay the same annually until their names are withdrawn from the subscriber's list on application to the Secretary. \$200 paid by the Connecticut Medical Society shall constitute the President and Fellows, *ex-officio*, members of the Society.

Those subscribers who pay \$100 or an equivalent annuity, or \$25 annually for five years, shall be Directors for life. Those who pay \$200 shall be Vice-Presidents for life. Any subscriber paying \$200 may at all times name one indigent patient who is to be received into the asylum

upon the most favorable terms. Any town, corporate body, or association of individuals, paying \$250 may have the same privilege.

Section IV provided for the appointment of a superintendent as follows:

There shall be a physician for the Retreat, who shall be nominated by a committee of five members appointed by the Medical Convention, and their nomination shall be transmitted to the Board of Directors for their approbation, if a Board of Directors shall be established by the by-laws of the corporation, otherwise to the Society for their approbation. If the person thus nominated shall not be approved, said committee shall nominate another person without delay. If the nomination shall be approved, the election shall be declared valid, and the person thus elected may hold his office until removed by a majority of the whole number of Directors. The medical and moral treatment of the patients shall be confided to him, and he is to determine the propriety of their admission and discharge.

This clause of the charter which was designed to enable the State Medical Society to control the medical management of the Retreat, was eminently logical and proper, since the institution was the substantial reward of great faith and hard work on the part of that medical fraternity. Besides, in those days well-informed medical men were the only class of citizens competent to determine the fitness of candidates for the position of superintendent.

Section III of the charter gives additional evidence that the state society regarded the practical activities of this medical establishment as being properly within its supervisory duties, as it provides for constant and continuous independent medical inspection in the following terms:

There shall be six visitors, physicians, two at least shall visit the Retreat every month. . . . They shall inquire into the medical and moral concerns of the institution, suggest improvements and designate abuses.

Two years later, at the May session of the General Assembly in 1824, this charter was amended by the omission of many details in the original, regarding subscribers, who should constitute the society, and other matters concerning the organization, management, etc., which could be regulated to better purpose and with greater facility in accordance with a constitution and by-laws devised by the managing officials, and changeable when working experience discovered a necessity therefor. This 1824 charter remained unaltered for 81 years.

The original charter having been obtained, the subscribers to the Retreat fund met in Middletown, October 28, 1822, to organize as a society. Dr. Woodward was appointed clerk. It was found that \$20,000 exclusive of the state grant had been pledged. There were more than 2000 subscribers. Thirteen had given \$200 each and were therefore vice-presidents. Nineteen had given \$100 each and were directors for life.

December 3, 1822, an adjourned meeting was held in Hartford to perfect business arrangements. It was voted to locate the asylum in Hartford. Accordingly a site in the southern part of the city was purchased, and early thereafter building operations were commenced.

January 7, 1823, the managing officials met and elected Dr. Eli Todd, physician to the retreat. "He first brought the attention of physicians to the need of a Retreat for the Insane, and when the object of his long contemplation and ardent desires was an accomplished fact, as if by general consent he was selected as physician and superintendent to carry into effect the benevolent plan of its founders." At first Todd demurred. He feared his acceptance of that office would lead the public to construe his strenuous efforts to establish the Retreat as personal and selfish. But he ultimately yielded to the unanimous solicitations of all interested parties.

Eli Todd was born in New Haven, 1770, and graduated from Yale College 1787. In 1790, when 20 years old, he commenced the practice of medicine in Farmington, where he remained 29 years, acquiring gradually a large practice and high repute as a skillful physician.

In 1808 a serious epidemic of "spotted fever" broke out, and persisted for fifteen months. 700 cases were seriously sick, and many died. The people became frightened and exhausted. No outside help could be secured, and panic prevailed; the streets being deserted for months. Dr. Todd's skill and character were among the town's best assets in those days. Governor Treadwell's account of the epidemic contains this statement, viz: "The attending physicians, Drs. Eli Todd and Solomon Everest, are worthy of much honor for their humane, painstaking and skillful services during the whole scene of distress." In 1819 Dr. Todd removed to Hartford, where he continued private practice until elected physician to the Retreat.

He was a man of rare mental endowments. "His judgment was profound, clear and discriminating; his apprehension remarkably quick; his memory strongly retentive, his imagination and fancy brilliant and ever awake. His tastes were delicate and refined, the source of much enjoyment to himself and much pleasure to others. His conversational powers were uncommon. Though usually affable, and often inclined to sprightfulness and gayety in his intercourse with others, yet his mind was naturally of a highly philosophical and speculative turn.

"On occasions when the subject required or admitted of it, he would give utterance to his sentiments and feelings in a style vivid, bold and figurative; abounding in striking imagery, interesting and picturesque descriptions or narratives, and lively sallies of wit and humor. No one on such occasions could be long in his presence without being sensible of, or paying homage to, the vigor of his understanding and the brilliancy of his imagination. But while his rare intellectual powers inspired sentiments of respect and admiration, his moral and social qualities, the attributes of his heart, secured to him the strongest attachments." "He possessed a mountain of benevolence," was the verdict of Spurzheim, the famous phrenologist, after making a personal examination of Dr. Todd. "Many who were his patients can testify to his kind-hearted sympathy in the sick-room, to the unwearied assiduity with which he watched at the bedside of the sick, to his anxious solicitude to devise and adopt every possible measure for their relief, and to the affectionate language and manner with which he aimed to allay their sense of distress when it could not be at once removed.

"In his intercourse with society, his manners and general deportment were usually courteous and gentle; he was ever frank, open-hearted and sincere; exhibited a high sense of honor, always despising what was mean and disingenuous, and ever attentive to all the decorums of time, place and character. Although he aimed, and with almost uniform success, to avoid giving offense, yet he was fearless and independent in expressing his sentiments and pursuing the line of conduct he chose to follow."

The Connecticut Retreat for the Insane was opened for the reception of patients in January, 1824. The public had come to expect grand results from its treatment of the insane. There

prevailed a wide-spread general interest concerning it, and faith in its success, strong from the first, was reassured when Todd assumed official charge. Time demonstrated the fact that such faith was well grounded. That his management of the Retreat was successful and wholly satisfactory to its patrons, his medical brethren and the general public, is certified by the annual reports of its operations and the recorded opinions of various authorities. Dr. Amariah Brigham, the founder of the *AMERICAN JOURNAL OF INSANITY*, and who was superintendent of the Retreat from 1839 to 1842, wrote that "Dr. Todd was eminently fitted for the moral treatment of the insane, in which he practically excelled. His great merit, we conceive, is his having zealously embraced and practically introduced into this country, and made extensively known here, the moral and medical treatment recommended by Pinel, Tuke and Willis. He made the law of kindness the all-pervading power of the moral discipline of the Retreat, and required unvaried gentleness and respect to be manifest towards the inmates of the institution by every member belonging to it. He early discountenanced depletion, particularly bleeding, in insanity, insisted upon the necessity of a generous diet, and recommended a frequent resort to tonics, in the medical treatment of insanity. This course of treatment, though it had been recommended by the best writers on insanity in Europe, had not to much extent been resorted to in this country previous to the time of Todd, and it was so contrary to that recommended by Dr. Rush that it required considerable boldness and much address to introduce it, and make it popular in this country; and this Dr. Todd accomplished."

At the corner-stone laying of the Connecticut Hospital for the Insane, Dr. Earle said:

Let it ever be remembered to the honor of Connecticut that she furnished one of the first prominent opponents to blood-letting,—this ultra-heroic, this war-like treatment. Dr. Todd, the first Superintendent of the Retreat, boldly resisted medical opinions of the day, at a time when such resistance required a strong will, founded upon a sense of duty and a moral courage worthy of all commendation.

Three or four years after Dr. Todd opened the Retreat, it was visited by Captain Basil Hall of the Royal Navy, who spent the years 1827 and 1828 in America, and subsequently published an

account of his travels with descriptions of many interesting things which attracted his attention. He writes:

Dr. Todd, the eminent and kind physician in charge of the Retreat, gladly communicated his plans and showed us over every part of the noble establishment—a model, I venture to say, from which any country might take instructions. . . . Dr. Todd's method is to treat every insane patient as if he were a reasonable being. . . . When a patient is brought to the Retreat, the physician converses with him freely, and without attempting to deceive states all that is known of his case; explains that he is brought there for the purpose of being cured of a disease which happens to affect his mind as it might have done his body. . . . That he will have every possible freedom consistent with his own safety and the comfort of his friends. The same cordial unreserved system is present from first to last.

Captain Hall incorporated in his published comments upon the Retreat, the following statements, which he copied from a report by the visiting physicians and which was probably written by Dr. Woodward:

Of the moral and medical management of the patients the committee are bound to give a brief detail, as the general plan of treatment adopted at this institution is more or less original, and different in some material respects from that pursued in any other hospital. In respect to the moral and intellectual treatment, the first business of a physician is to gain the patient's entire confidence. With this in view he is treated with the greatest kindness, however violent his conduct may be,—is allowed all the liberty his case admits of, and is made to understand, if he is still capable of reflection, that, so far from having arrived at a mad-house where he is to be confined, he has come to a pleasant and cheerful residence where all kindness and attention will be shown him, and where every means will be used for his recovery to health. In no case is deception employed or allowed; on the contrary, the greatest frankness as well as kindness form a part of the moral treatment. His case is explained to him, and he is made to understand, as far as possible, the reason why the treatment to which he is being subjected has become necessary.

By this course of intellectual management it has been found, as a matter of experience at our institution, that patients who had always been raving when confined without being told the reason, and refractory when commanded instead of entreated, soon became peaceable and docile.

This course of treatment, of course, does not apply to idiots, or those laboring under low grades of mental imbecility, but it is applicable to every other class of mental disorder.

In respect to the medical and dietetic treatment, it also varies essentially from the main from the course adopted at other hospitals.

Formerly patients laboring under a mental disease were largely medicated, chiefly by emetics, cathartics, and bleeding. At the present time,

this mode of treatment has given place to intellectual and dietetic regimen in some European hospitals. The physician of our hospital has introduced a course of practice differing from both these, but partaking more or less of each. He combines medical and moral treatment, founded upon the principles of mental philosophy and physiology. In one class of cases moral, and in another medical, treatment become the paramount remedies; but in each class of cases both are combined. The proportion of cures which have been effected at our Retreat has satisfied your committee that the mode of treatment there adopted is highly salutary and proper.

Dr. Pliny Earle has observed that while the visiting physician's original report attracted little notice when it appeared, as a part of the annual Retreat report, when it was thus publicly "recognized and endorsed" by a prominent British naval officer, it "became worthy of recognition on this side of the Atlantic. The newspapers took it up and sent it through the length and breadth of the land, and in this way, whatever a few physicians might have learned from the report itself, the people at large received their first impression that insanity is largely curable."

In the early part of the 19th century, optimistic ideas respecting the curability of insanity prevailed. Dr. Burrows, of London, published a book in 1820, in which he claimed that "of all insane cases treated by him in hospital and private practice, the proportion of recoveries was 81 in 100—recent cases 91 in 100, and of chronic cases, 35 in 100. Dr. Willis and other specialists in mental disease claimed like success in their practice.

No doubt they stated facts, but in those days the term "insanity" was limited in its application to the more obvious departures from the normal, in mental states. Asylums had been provided to accommodate only the more pronounced cases of insanity, the violent or deeply depressed patients—those classes which will always show a high percentage of recovery. Moreover, in those days the standards which signified recovery were not sufficiently exacting to preclude errors.

Statements published in the early Retreat reports simply confirmed current theories on this subject. In the first seven years of its operation, the Hartford Retreat received 147 recent cases and discharged as recovered 132 of them, or about nine-tenths. And yet Todd was strictly honest in his returns. His sincerity cannot be doubted, since he annually published an epitome of his records, giving the consecutive number and the initials of each patient, the

diagnosis, duration of attack, time under treatment and condition on discharge.

Those early authorities had to depend upon available statistics, and chiefly those representing their own experience, which was too limited to warrant conclusions as to the general curability of insanity; and their claims never bore that import. They always proclaimed that their recovery rates were computed upon the early treatment of acute cases.

While Tuke's genius for conciliatory tactics and captivating kindness were phenomenal, patients were occasionally subjected to mild forms of mechanical restraint in the York Retreat, and the same must be said concerning the Hartford Retreat. The logical consummation of Tuke's humane theories—"non-restraint" of the insane—was not worked out and advocated until about twenty years after the Hartford Retreat was established.

When hospitals for the insane were so small that the superintendent could spend much time with any particular patient when really necessary; and such men as Tuke and Todd presided over such hospitals—there was no necessity for strict injunctions on this score. Their tactful approach and soothing ways seldom failed to control the insane, and the infrequent employment of restraint, under such conditions, generates no vicious, far-reaching influence. But when the number of patients in individual hospitals became so large that the presiding administrator could not keep in personal touch with all the circumstances, and was obliged to delegate authority to subordinates, and trust employees to render the necessary service to refractory patients, the necessity for explicit and strict rules forbidding restraint became urgent, if the insane patients are always to receive kind treatment.

Todd plainly saw that Tuke's methods of "moral treatment" were new and rational applications of natural law to the treatment of insanity; wise and ingenious attempts to regulate by interesting employment the mental and physical ebullitions of the insane, which naturally augment, when suppression by arbitrary force is attempted.

He apprehended what the judicious, systematic application of such humane laws signify to the insane and their friends. At once the far-reaching possibilities of "moral treatment" of the insane enlisted his sense of justice, and became his working ideal.

His subsequent life-work with the insane demonstrated that he had sensed the true essence of Quakerism. In those days, for a scientific physician, such as Dr. Todd was, to grasp at the promise of "moral treatment" to benefit the insane, to study and master its application conjointly with his superior medical skill, were rare exhibitions of altruistic nobility.

Just as other belated reforms have failed to crystalize and acquire individual potency until exploited by some single-minded enthusiast; so it required the benevolent genius of a layman, like William Tuke, to sufficiently accentuate the importance and dignity of "moral treatment" for the insane, so that it never again could be ignored.

But Todd's prompt and complete recognition of this new principle of insane hospital practice was exceptional. Eminently humane and important as was this reform, it advanced slowly in England, and forty years after Todd addressed the Medical Society and the State Legislature upon this matter, some insane persons in Connecticut were still chained.

It required a modest philanthropic spirit in an educated physician to openly patronize a layman's conception of the proper treatment of insanity.

It required the broadest sort of a scientist to admit that the supreme interests of the insane depended upon scientific diversion, sympathy and scientific mental stimulus, more than upon the scientific administration of drugs.

And furthermore, it required a philosopher to associate these dissimilar yet complementary agencies in a symmetrical and practical policy of hospital management.

Yet the peerless Todd was equal to any and all such demands upon mental and moral resources.

He unhesitating formulated his scheme of action and diligently pursued it as long as he lived.

His system was not a code of rules for subordinates to enforce, not austere, remote authority; but personal devotion and painstaking labor with his patients—that method of true leadership in a good cause which always commands respect and insures success.

While those associated with him, and those competent to judge, were enthusiastic respecting his proficiency, his attainments in

the practice of "moral treatment" never fully satisfied his personal ambitions in that form of medical art.

After his death the Retreat managers, in estimating his worth, stated:

To revise and improve, or perhaps it may more properly be said, to devise and establish a more perfect system (of moral treatment), was among the latest and most ardent desires of our late, much respected and lamented physician.

While Dr. Todd had decided convictions and was tenacious of his opinions, he was firm but never aggressive. In fact, he must have been a very modest man. The universal esteem in which he was held, and the many recorded tributes to his nobility of character, imply as much.

This conclusion is reinforced by the fact that he never wrote for publication except when plain duty compelled. Besides his reports to the Medical Society, the legislature and a few Retreat annuals, nothing from his pen has been preserved in book or journal.

And such regrettable silence, in a man occupying a prominent, public position, engaged in pioneer work of great import to society, and possessed of conspicuous natural gifts, in respect of power of observation, and the arts of rhetoric, argues a sensitive, retiring nature.

In short, all that he did write and all that was written about him, serve to illustrate the conviction that in Todd's personality egoism was delightfully obscured by magnanimous altruism.

His profound sympathy for the insane which stamped all his views and conduct, may have had some relation to the presentiment, which no doubt haunted him, that the integrity of his own mind was not well assured, as two members of his immediate family had been insane.

He was elected President of the State Medical Society in 1827 and 1828, but declined re-election in 1829.

Towards the end of his life he became deeply interested in the subject of inebriety and its treatment. As chairman of a committee appointed to consider these questions, he made a report to the State Medical Society in 1830.

That report discusses the pitiable condition of the habitual drunkard, his sufferings, and the miseries his intemperate habits entail upon others.

It gives an estimate of the financial burdens which intemperance imposes upon the family, the community and the state. It considers the necessity for legal restraints and penalties, but recognizes the inadequacy of fines and imprisonment for alcoholic excesses. The physical, mental, and moral conditions of the inebriate are analyzed to exhibit his broken-down standards of health, and to show that such moral weaklings ought to be subjected to an "enlightened system of physical and moral treatment" which can be properly enforced only in an institution designed especially for their custody, treatment, and reformation. The Medical Society, influenced by this report, adopted Todd's views, and

Resolved, That in the opinion of this convention, it is expedient to establish in this State, an asylum for the reformation of inebriates.

Doubtless the medical men intended to follow the methods by which the Retreat had been founded and financed. A central committee, which embraced Drs. Todd, Woodward and Sumner, was elected to advance the enterprise, and a sub-committee, for correspondence and co-operation, consisting of two members from each county society, was also appointed.

Had such an institution then materialized its operations, as projected by Dr. Todd, it would have accomplished much good and probably would have served as an object lesson to determine public opinion upon this still perplexing question.

Just how far the medical committee proceeded is not certain. But at that time Dr. Todd was a sick man. Paroxysms of angina pectoris subsequently developed and he survived this appointment only three years.

Meanwhile Dr. Woodward had left Connecticut to take charge of the Worcester State Hospital. Thereupon the inebriate asylum proposition languished in this state until Dr. George B. Hawley espoused the cause, some forty years afterwards.

Dr. Todd's hospital management was widely appreciated. An offer of the superintendency of the Bloomingdale Hospital in New York was made to him. And again a like offer to take charge of the Worcester State Hospital in Massachusetts was also urged upon him. Notwithstanding he would have received a higher salary at either of the other institutions, he remained loyally attached to the Hartford Retreat.

From all accounts, written estimates of his character and ability, and verbal traditions which are still repeated in this community, it must be admitted that Dr. Todd was a remarkable man; possessing a charming personality, with a ready command of a richly endowed, well-balanced and brilliant mind. In cultured social circles he was conspicuous for his breadth of knowledge, his grace of speech, his wit and versatility; yet he chose to devote those rare conversational gifts, in humble service, to the benefit of the afflicted insane.

His unusual oratorical powers, which enabled him to mold the thoughts and feelings of a public audience; the skillful argument, the power of sincerity, and the command of pathos, were assiduously employed in cheering the despondent, in soothing the irritable, endeavoring to dissipate delusions, and comforting everybody within his reach.

And such was his daily occupation at the Retreat for nearly ten years—till his brilliant and useful career was terminated by death in November, 1833.

His medical friend Thomson, of Farmington, wrote of him as follows:

In the managing of cases of insanity, perhaps no man has ever been more successful. The Retreat under his superintendence was raised to a rank second to none, perhaps superior to any other similar institution on this continent.

The medical visitors, in their final tribute, say:

The past year has been an era that will be long remembered,—the sickness and death of him to whom under Providence, may be assigned, perhaps more than to any other individual, the high honor of originating the design of founding this institution. The united testimony of patients and friends constitute a memorial of his kindness and the success which has crowned his exertions will be an enduring monument to his skill and professional work.

His intimate and appreciative friend, Dr. Woodward, published the following summary:

He took the Retreat in its infancy, without patients and almost without resources, at a time when public sentiment was far from being favorable to such institutions. He adopted a course of management peculiarly his own, carried it into successful operation, and gave to the Retreat a character for the comfort and care of its members, not surpassed in this or any other country.

Here, too, he raised himself a name for intelligence and philanthropy as imperishable as the cause of humanity.

Notes and Comment.

THE PRESENT STATUS OF VOLUNTARY ADMISSIONS TO INSTITUTIONS FOR THE INSANE IN THE UNITED STATES.—No section of law seems more vague and lacking in uniformity than that governing the admission of voluntary patients to institutions for the insane, as now found in the statutes of the various states.

California enacts that any suitable person may be admitted voluntarily "who is suffering from mental disease, but is competent to make a written application." He cannot be retained more than seven days except upon legal proceedings required by considerations of safety.

In Colorado, a voluntary patient may be admitted "whose mental disease is not such as to render it legal to grant a certificate of insanity." If such person desires to leave the institution he must give three days notice.

In Connecticut, a voluntary patient may be admitted "whose mental condition is not such as to render it legal to grant an order as to his insanity." Such person cannot be detained against his will more than three days.

In Illinois on the other hand, it is provided that "any person in the early stages of insanity, on his own written application accompanied by a certificate from the county court of his county, can be admitted as a voluntary patient." He cannot be detained more than three days against his will.

In Maryland, which seems to have had one of the earliest enactments on the subject, a voluntary patient "may be admitted who makes application in writing provided that the expense is borne by the person applying, or by his relatives or friends"; he cannot be detained more than three days against his will.

In Massachusetts, the provision is simply that the "superintendent may receive any person as a voluntary patient, who makes application and is mentally competent to make it." He cannot be detained against his will more than three days.

In Michigan there is a curious provision that residents "who are afflicted mentally or with serious nervous disability, but *who are not insane* may be admitted as voluntary patients. A voluntary patient must present certificates signed by two physicians having legal qualifications "stating that the person needs asylum treatment but is not insane." No provision exists for his discharge from the institution if he desires to go away. He may, however, be discharged at any time by the medical superintendent. It is further stated that if he is found insane he must have legal proceedings instituted to effect his regular admission.

In Minnesota, the provision is that "any person believing himself to be afflicted with mental disease" upon written application signed in the presence of two witnesses not employees or officers of the institution may be received at a detention hospital. If he demands his release and is deemed unsafe to be at large, he must be examined by the state hospital commission within three days and committed or discharged.

In New Jersey "any resident of the state believing himself about to become insane and desiring to submit himself to treatment," if he is competent to make an application may be a voluntary patient. He must pay his own expenses and cannot be detained more than three days after giving notice.

In New York, it is provided that "any suitable person, who voluntarily makes written application" and is "competent to make it" may be admitted to a state hospital or licensed private institution. He cannot be detained more than ten days against his will.

In Pennsylvania, "persons who are threatened with mental disorders and voluntarily place themselves in institutions for the insane may be received for a period of one month or less by an agreement which must specify the time and be signed by them at the time of admission." At the end of one month they may renew the agreement.

In Ohio "a person in an incipient state of mental derangement may apply" and be received as a voluntary patient, but he cannot be kept more than 60 days. Five voluntary patients only can be admitted to any one (state) hospital and none can be admitted if the quota of the county is full. This seems to render the provision of very little moment.

In Rhode Island a voluntary patient may be received "who is desirous of submitting himself to treatment and makes a written application, but whose mental condition is not such as to render it legal to grant a certificate of insanity." He cannot be detained against his will more than three days.

In Vermont, any voluntary patient may be received "who seeks treatment and makes written application" for admission, "without a certificate of two physicians." He cannot be detained more than forty-eight hours against his will.

In Wisconsin a voluntary patient who is "insane or suffering from mental disorders may upon his written application supported by certificates of at least two physicians be admitted" to a state institution. He cannot be detained more than five days against his will.

It will be noticed that the phraseology is vague and not always clear and in some states it must be clearly shown by medical certificates that the person is *not insane* and yet is a fit subject for hospital treatment. In other states the patient *must be clearly insane* and his insanity must be shown by legal certificate. In others the patient *must be insane but not in such manner as to be certifiable by physicians*. Much of the confusion undoubtedly arises from the fact that according to the decision of a number of appellate courts the confinement of an insane person is not legal unless the person is dangerously insane either to himself or to the community. In several states unquestionably the reference to the insanity not being of such character as to be legally certifiable has reference to this legal view of insanity. In some states indigent patients can be admitted in this manner; in others provision is made that the expenses of the voluntary patient shall be paid by himself or his friends.

In Michigan, the first section of the law authorizes the admission of voluntary patients provided that they are not insane and are maintained without expense to the state, but a subsequent section of the law provides that indigent patients may by action of the trustees be admitted as voluntary patients. This latter section, however, was nullified by the opinion of the attorney-general.

During the past five years a large number of states have legalized the voluntary admission of patients. It is to be hoped that within the next five years all states may have a similar provision of law.

It is difficult to get accurate data of the extent to which voluntary patients avail themselves of this privilege. We were informed at the Atlantic City meeting in 1910 by Dr. Ferris, of the Lunacy Commission, that the number of voluntary admissions during the previous year in New York had been small.

In Maryland very few voluntary patients have been admitted to state hospitals, but in one private hospital, in Maryland, with a very active service, during the past three years, about 60 per cent of the total number of admissions have been voluntary patients. In another private hospital, of Maryland, with an equally active service scarcely any voluntary patients other than inebriates have been received.

At the pavilion for the insane of the Albany N. Y. Hospital every patient is a voluntary admission and no others are admitted.

At Butler Hospital, Providence, R. I., voluntary patients constitute fully 36 per cent of all admissions.

At the Brattleboro Retreat fifty-three voluntary patients have been admitted during the past year. In Colorado on the other hand notwithstanding a long-standing provision of law no voluntary patients are reported. It would seem the part of wisdom for all hospital officials to encourage voluntary admissions and seek to place their institutions on the same footing in the admission of patients as general hospitals.

SIR THOMAS CLOUSTON ON LARGE HOSPITALS.—Far be it from us to suggest any parallelism between the old man of Horace, about whom gather the discomforts of age, and Sir Thomas Clouston, most genial and still most active of British alienists. For where indeed could one find psychiatrist of the Nestor's long and honorable experience less testy, less inclined to praise the way of an earlier world, or one less *castigator censorque minorum*? But we beg leave, without disrespect and in affectionate esteem only, to use the two words as those of endearment and, by adding a third, to dub our venerable confrère the grand old man of British psychiatry. And with this brief introduction, the JOURNAL wishes to call to the attention of its readers a recent proof in print of this appreciation in his informing article, "The Argument for the Large State Insane Hospital," published in the issue of the *Boston Medical and Surgical Journal* for February 27,

1913, being a reply to a paper under the same title by Dr. Walter Channing, in the same journal, of date August 1, 1912.

Upon reading Dr. Channing's article in the light of Sir Thomas Clouston's reply, one inclines to the view that the two critics are after all in substantial agreement. It was not so much a plea for the large hospital that Dr. Channing made as an attempt to find the extenuating circumstances that surround its origin and so to make way for a greater tolerance of judgment in the conflict of expediency with principle. This attitude of mind appears to be shown in his reference, seemingly with approval, to Dr. Pilgrim's paper of nearly five years ago * on "The Proper Size of Hospitals for the Insane," which was a vigorous protest against the monster growths in its author's own State, supported by eloquent statistics. Dr. Pilgrim was able to make figures do his bidding and to justify the smaller institution even on pecuniary grounds. He took the lowest net maintenance rate in one of the smaller hospitals, which was \$148.40, and by comparing it with the lowest net rate in one of the larger hospitals, which was \$157.54, found a difference of \$9.14 per capita in favor of the smaller institution. These figures seem to support the contention of Sir Thomas that in his experience large hospitals have not always been economically the most successful.

It appears that while the average yearly cost for each patient in the whole of the County and Borough Asylums of England, large and small, is £26 13s. a year, the cost in the thirty-five asylums with over a thousand patients in each is £26 17s., so that there is no saving of money by enlarging institutions to that size. Statistics also show that the recovery rate (based on admissions) is considerably higher in the so-called "Registered Hospitals" (for private patients only) than in the County and Borough Asylums, namely, 47.5 per cent against 33 per cent, though Sir Thomas, while noting the striking fact, frankly admits the insufficiency of the ground for an absolute scientific induction. Still it is beyond question that the smaller hospital with its more numerous staff of nurses must have much to do with the higher rate of recovery.

* American Journal of Insanity, October, 1908.

The considerations which should have weight with physicians, humanitarians and legislators are, he thinks, the happiness, cure or amelioration of the patient; the cost of the proposed arrangements; and—which is also important—their effect for good or evil on the relatives and on public opinion. As an illustration of the humane spirit which pervades the article, we may quote, referring to the third aspect of the question, this sentiment: "It is a fact to be deeply deplored that in all Christian countries there is a strong and cruel prejudice against those who suffer from mental disease and defect, a prejudice which right-thinking and well-instructed men and women should strive earnestly to combat. The kind of hospital in which they are treated manifestly affects this prejudice. The man or the institution that in any way lessens this handicap of the direst affliction of humanity does a great service to civilization and makes life more worth having to millions of afflicted men and women. The patients and their relatives are alike made happier."

We learn that in Scotland there is only one hospital which exceeds, and that very slightly, a thousand patients.

The article mentions an argument against large hospitals which is seldom heard but which nevertheless has much force, namely, "the tendency to a deteriorating and hardening effect on the minds of the patients whom they cannot study medically, and of the lay officials, through their coming in daily contact with such vast numbers of demented people." And he points out that these people, being "largely uninteresting and unlovable, suggestive of no new and stimulating ideas and a dead-weight on the intelligence and emotions," one needs all the sense of duty that one can summon, all one's medical instincts and all the feeling of human kindness to grasp and grapple with that benumbing influence even in institutions of moderate size.

The argument for accessibility is not new (Dr. Pilgrim laid stress on it in his paper already mentioned) but it is not the less cogent. In the monster institution, especially one situated at a considerable distance from any large city, the tendency is for the relatives to neglect the patient. Indeed, to many a poor person the expense of the journey becomes prohibitive. Says Sir Thomas: "There is no critic so keen about the neglect of a patient as a mother or a maiden aunt. There is no stimulus so

good for the nurses and officials and doctors, and so effective, as a personal appeal on the part of a near relation of a patient. Is it not one of the primary rights of a citizen, sane and insane, to have reasonable facility of visiting or being visited when suffering from disease of any kind? I think myself that this is as much a humanitarian requirement as being housed and clothed and fed and nursed and doctored."

In conclusion, Sir Thomas Clouston expresses the belief that intellectual and administrative inertia is at the bottom of most of the large additions to existing hospitals—too great a disposition to follow easy lines of least resistance, and he tells us that we should be on safer ground if, as physicians, we should follow our medical instincts instead of giving undue weight to such motives of expediency as ease of administration and the saving of money.

We welcome the caution which Sir Thomas preaches and this JOURNAL is in fullest sympathy with the kindly spirit of his teaching in accepting his final admonition, "The United States and Canada would do well to make further inquiries before they follow our example."

OPENING OF THE HENRY PHIPPS PSYCHIATRIC CLINIC.—The trustees of the Johns Hopkins Hospital and the trustees of the Johns Hopkins University, of Baltimore, have issued invitations to the opening exercises of the Psychiatric Clinic "established and erected by Henry Phipps, Esq., of New York, as a department of the Hospital and of the University to promote the study of mental diseases and its early treatment."

An extensive and interesting program has been arranged, covering portions of three days, April 16, 17 and 18, as follows:

APRIL 16, 1913, 3 P. M.

THE HENRY PHIPPS PSYCHIATRIC CLINIC.

Invocation—Rufus M. Jones, D. Litt., Minister, Society of Friends, Haverford College, Pa.

Introduction—Dr. William H. Welch.

The Clinic and the Community—Dr. Stewart Paton.

A Word of Appreciation—Henry D. Harlan, President of the Board of Trustees, The Johns Hopkins Hospital.

Specialism in General Hospitals—Sir Wm. Osler, Bart., F. R. S., etc.

INSPECTION OF THE BUILDING—TEA.

APRIL 17, 1913, 10 A. M.

THE RECREATION ROOM OF THE HENRY PHIPPS PSYCHIATRIC CLINIC.

The Sources and Direction of Psycho-Physical Energy—Professor W. McDougall.

Autistic Thinking—Professor E. Bleuler.

Personality and Psychosis—Professor A. Hoch.

The Personal Factor in Association Reactions—Dr. F. L. Wells.

4.30 P. M.

VISIT TO THE SHEPPARD AND ENOCH PRATT HOSPITAL—TEA.

8.30 P. M.

MEETING AT OSLER HALL, MEDICAL AND CHIRURGICAL FACULTY BUILDING,
1112 CATHEDRAL STREET.

A Study of the Neuropathic Inheritance in Relation to Insanity—Dr. F. W. Mott, F. R. S.

Pellagra—Professor O. Rossi.

Psychic Derangements Associated with Ductless Gland Disorders—Professor H. Cushing.

APRIL 18, 1913, 10 A. M.

THE RECREATION ROOM OF THE HENRY PHIPPS PSYCHIATRIC CLINIC.

Primitive Mechanisms of Individual Adjustment—Dr. S. Paton.

"*Demenz Probleme*"—Professor Heilbronner.

The Interrelation of the Biogenetic Psychoses—Dr. E. Jones.

The Prognostic Significance of the Biogenetic Psychoses—Dr. G. H. Kirby.

1 P. M.

LUNCHEON AT THE JOHNS HOPKINS HOSPITAL.

2.30 P. M.

THE RECREATION ROOM OF THE HENRY PHIPPS PSYCHIATRIC CLINIC.

Address—Dr. Achucarro.

Anatomical Borderline Between the So-called Syphilitic and Metasyphilitic Disorders—Dr. C. B. Dunlap.

Disorders Connected with Anemia—Professor A. M. Bartlett.

Closing Address—Professor A. Meyer.

Arrangements are being considered, and we trust that they will be carried out, to publish the addresses and papers above enumerated as a special number of the JOURNAL.

APPOINTMENT OF DR. L. VERNON BRIGGS.—Governor Foss, of Massachusetts has appointed Dr. L. Vernon Briggs, of Boston, a member of the State Board of Insanity in place of Dr. Herbert B. Howard who has been president of the board for several years and whose term has expired.

The board elects its president, and it remains to be determined who shall succeed Dr. Howard in that office.

Dr. Briggs brings to the position to which he has been appointed a large degree of enthusiasm and zeal and will, we predict, be an active member of the board. He has recently been elected president of the medical staff of the Boston Dispensary, but will, we understand, give up his general practice to devote his time to his new duties.

AN ORGANIZATION FOR THE STUDY OF EUGENICS.—The Eugenics Record Office, which was established at Cold Spring Harbor, Long Island, in October, 1910, by Mrs. E. H. Harriman, and which has ever since been active in this field, with the additional assistance of Mr. John D. Rockefeller and others, has recently entered upon a new stage of its development. A board of scientific directors has been organized, comprising Dr. Alexander Graham Bell, chairman; Dr. William H. Welch, professor of pathology, Johns Hopkins Hospital, vice-chairman; Professor Irving Fisher, Yale University, Professor Lewellys Barker, of Johns Hopkins Hospital; Professor E. E. Southard, of Harvard University and director of the Psychopathic Hospital, Boston; and Dr. C. B. Davenport, secretary of the board and resident director. The board met at Cold Spring Harbor on March 21, and organized its work. The aim of the Eugenics Record Office was defined to be as follows: First, to promote researches in eugenics that shall be of utility to the human race. This part of the program includes the study of America's most effective blood lines and the methods of securing the preponderance and relative increase of the best strains; the study of the origin of and the best methods of restricting the strains that produce the defective and delinquent classes of the community; the study of the method of inheritance of particular traits; the study of the consequences of the marriages of close kin; the study of miscegenation in the United States; the study both in this country and abroad of the

family histories of permanent emigrants. Second, to publish the results of these researches. Third, to provide a fireproof building for the preservation of eugenical records, including genealogical works and town-histories. Fourth, to provide an administrative office and staff to carry out the work.

The fireproof building that is to form the new home of the office is being rapidly pushed to completion.

The Board of Scientific Directors of the Eugenics Record Office will meet each spring at Cold Spring Harbor to consider the projects most worthy of support during the ensuing year, which begins October 1, and it will meet again in November to receive a report of the work of the office in the preceding fiscal year. The resident director has general charge of the plant and its operations and is authorized to ask for and receive, in the name of the board, funds to carry on the work of the office. The board voted in favor of the organization of a Eugenics Research Association, of which a meeting will be called early in June.

Book Reviews.

Experimental Studies of Mental Defectives. A Critique of the Binet-Simon Tests and a Contribution to the Psychology of Epilepsy. By J. E. WALLACE WALLIN, PH. D., Director of Psychological Clinic, School of Education, University of Pittsburgh. \$1.25. (Baltimore: Warwick & York, Inc., 1912.)

In this, the seventh of the series of Educational Psychology Monographs, Dr. Wallin presents the results of a systematic and critical study of the Binet-Simon scale applied to over 300 epileptic residents of the state colony at Skillman, N. J. The inquiry occupied a period of 8 months during which Dr. Wallin was resident at the colony, and during which measurements of standing and sitting heights, of weight, of lung capacity, of the strength of right and left hand grip, of station or body sway, and of the speed of performing the form board test were also made. It is needless to say that these inquiries were carefully carried out. In using the Binet-Simon scale Dr. Wallin used a *wide range* method, that is, he tested the majority throughout the greater part of the scale, undoubtedly a more reliable method than by using tests near to the ages where the patients graded. This was done to test the reliability of the scale as well as to reveal the peculiar mental lapses which might characterize the mental deterioration of the subject. As might be expected this method showed a number of subjects who failed on lower ages but who successfully passed the tests of a higher age, which made the question of scoring complicated at times.

Dr. Wallin used the 1908 scale in order that his results might be comparable with those obtained by others. Like others he reaches the conclusion that the 1908 scale needs revision, as some of the tests are too difficult and others are too easy for the ages in which they are placed. He does not exactly agree with Goddard's revision of 1911 and believes that the Binet-Simon scale is still in an experimental stage and that "no pains should be spared to ferret out its present imperfections." He concludes that "there is no other single instrument available which gives us a *superior preliminary survey* of a defective or mentally deviating individual."

It seems needless to say that Dr. Wallin has made a valuable contribution to the psychology of epilepsy and to our knowledge of the Binet-Simon scale.

The book is well printed and is illustrated with a number of graphs. The final chapter gives explicit directions for applying the Binet-Simon scale.

W. R. D.

Index-Catalogue of the Library of the Surgeon-General's Office, United States Army. Authors and Subjects. Second Series, Vol. XVII, Suaheli-Testut. (Washington, 1912.)

This volume includes 2357 author titles, representing 3850 volumes and 8490 pamphlets. It also contains 3571 subject titles of separate books and pamphlets and 38,898 titles of articles in periodicals. As might be expected the list of titles belonging under Surgery and under Syphilis occupy more pages than any other subjects.

The value of the Index to the medical profession has been so often previously expressed and is made so obvious by reference to the work that it needs no further reiteration here.

W. R. D.

Thirteenth Annual Report of the State Board of Insanity of the Commonwealth of Massachusetts for the Year ending November 30, 1911. (Boston: Wright & Potter Printing Co., State Printers, 18 Post Office Square, 1912.)

There is much in this report of interest, so much in fact, that it is somewhat difficult to select parts to abstract. Massachusetts has always taken a leading place in the care of the insane and defectives and continues to hold this place. It is perhaps indicative of the broad-mindedness which is responsible for this position that we find a statement like the following:

"(c) Recommendation of an *increase in the number of ward physicians.*

With an increased number, better work could be performed, and with more time from purely routine work, each member of the staff should be expected to produce some original work or observations each year. Such activity is most desirable in developing a worthy medical spirit in the hospital, and should be encouraged if not demanded. Productions of this character might or might not be valuable to the medical profession, but they would surely aid in the development of the physician who made them, and react favorably upon other staff assistants and the hospital work. Continuous overwork in performance of daily routine may be good for the individual in acquiring habits of industry, but it does not make for the best development of either the hospital physician or service."

Considerable space is given up to discussion of financial affairs which will undoubtedly interest those who are responsible for this part of hospital administration.

Of greater interest are the reports of the two semi-annual conferences which were held and at which were discussed: Measures for improving the condition and promoting the efficiency of nurses in our state institutions, and the relation of social service to our institutions. The discussions on both of these subjects was stimulating and will well repay perusal. For purposes of reference it would be more convenient were they better indexed and the titles displayed, but this is a very small defect in a most excellent report.

W. R. D.

Second Annual Report of the State Charities Commission to the Honorable Charles S. Deneen, Governor of Illinois. Springfield, Illinois, December 31, 1911. (Springfield, Ill.: Illinois State Journal Co., State Printers, 1912.)

This report is somewhat voluminous occupying 532 pages, the first 278 being given over to reports of visits to various state institutions, or to reports upon such questions as the work of the executive secretary during the year, the dependent child—present system of care inadequate and unsatisfactory—complete state care in state institutions advocated with abolition of the private institution—a plea for the natural rights of the normal child who has been left a dependent upon the charity either of the private citizen or the state, a report by A. L. Bowen, Executive Secretary of the State Charities Commission, upon the closing of the original graveyard at the Peoria State Hospital, with figures on its population and death rate since its opening, etc. While at first sight this seems an unusual way of making a report it is a convenient one and the very full titles well indicate the character of what follows. The remainder of the book is given over to reports of inspections of county jails, of outdoor relief by counties, of inspections of the county infirmaries, and statistics of the county infirmaries. An index concludes the book which is well printed and bound. While there is much of interest in the report there seems to be too much irrelevant detail in parts. Nowhere do we find a list of the members of the commission, or the address of the secretary, or such important matters as the per capita cost, increase in number of insane, etc., yet the programs of the graduating exercises of the training schools are given in full.

W. R. D.

The Psychology of Insanity. By BERNARD HART, M. D. (Cambridge University Press. New York: G. P. Putnam's Sons, 1912.)

In this manual, so brief that it may be read without skipping (and surely no reader would be tempted to that) in two evening sessions, the author elucidates with admirable comprehensiveness, and in language that any intelligent layman can understand, the recent developments in abnormal psychology which are attracting so great attention the world over. After a concise review of the history of insanity the reader's mind is gradually prepared for the "psychological conception" of the disease, a conception based on the view that the processes of the human mind can be profitably studied without reference to the accompanying changes which are presumed to take place in the brain itself and that, therefore, insanity may be properly attacked from the standpoint of psychology. Then, applying this conception to the phenomena of insanity, Dr. Hart proceeds to show that these latter are the result of definite psychological causes operating in obedience to definite laws. The chapters on dissociation, complexes, conflict, repressed complexes and projection are the last word on abnormal psychology as nowadays conceived by the modern school. The author's treatment of the repressed complex is a particularly good

piece of exposition, simplified materially by the use of diagrams showing how direct entrance of ideas and emotions into consciousness may be blocked or resisted. He explains with singular lucidity how, homogeneity having disappeared because the mind contents are incompatible with each other, dissociation arises "as a method of avoiding the storm and stress which the warring of these mutually hostile elements would otherwise inevitably produce." Conflict, therefore, in Dr. Hart's view, would seem to be a fundamental factor in the causation of insanity, though he admits that the significance of conflict is very imperfectly understood and that but little definite knowledge concerning it has so far been established. We do not remember to have read anywhere else a statement of the Freudian doctrines at once so clear and so free from indelicacy. Indeed the volume might safely be placed in the hands of the most sensitive and inquisitive person without exciting the least prurieny.

Let the following summary be quoted not only by way of illustrating the judicial quality of the author's mind but also as a specimen of his lucid style:

"Freud considers that the origin of all cases belonging to certain varieties of mental disease can be traced back to factors connected with a single one of the great instincts, that of sex. We should expect, of course, that the immense power of the sex impulses, and the opposition which inevitably arises between them and the rules of conduct imposed by civilised society, would make this instinct one of the most prevalent sources of conflict and mental disintegration. Nevertheless Freud's generalization is considered by most authorities to be exaggerated, and has not been universally accepted. The evidence produced in its favour is, indeed, not altogether convincing, and, even allowing for the fact that Freud's conception of sex is far wider than is covered by the ordinary use of the term, his theory cannot be said to have been satisfactorily established.

"It is probably safer at the present time to assume that the conflicts in question may involve factors connected with any of the fundamental instinctive forces of the mind, provided that these factors are of sufficient emotional intensity. We shall readily admit that sex probably plays a predominant part in a majority of cases, but shall be prepared to find that a certain number are dependent upon conflicts in which other mental elements are mainly concerned."

Among the "other mental elements" referred to in the foregoing paragraph Dr. Hart lays emphasis on the "herd instinct." Here he has in mind "the mechanism by which the ethical code belonging to a particular class is enforced upon each individual member of that class, so that the latter is instinctively impelled to think and to act in the manner which the code prescribes." And he points out that conflict thus arising is well exemplified in the case of sex where the impulses due thereto are constantly thwarted by the opposing tendencies arising from our moral education and traditions. It is the "herd instinct" of gregarious animals which tends to make the conduct of the individual conform to that of the community as a whole; and here it may be said parenthetically that one

could hardly have a better illustration of that moulding and compelling force, and of the inevitable conflicts to which it gives rise, than that furnished by Arnold Bennett's recent drama, "Milestones," in which the interplay of Bourbonism and progress suggests the factor in ætiology which the author here considers.

The book is published, at a very modest price, by the Cambridge University Press as one of "The Cambridge Manuals of Science and Literature." We commend it unreservedly not only to the physician, who may learn much, but to the layman, who may learn still more, from its telling lesson.

Obituary.

IRA VAN GIESON, M. D.

Word has just come that Dr. Ira Van Gieson died in Bellevue Hospital, New York City. The circumstances of his death are not now known.

Dr. Van Gieson is best known to the readers of this journal through his connection, years ago, with the Pathological Institute of the New York State Hospitals, and any account of his life is necessarily largely an account of that institution.

At a time in the early 90's, when scientific psychiatry was practically unknown in this country, Dr. Carlos F. McDonald, then president of the New York State Commission in Lunacy, conceived the idea of the organization of a central scientific department for all of the New York State hospitals. This conception was somewhat ahead of the times, but it was well formulated in the mind of Dr. MacDonald, whose large experience as an executive and administrative officer enabled him to plan this institution along broad and generous lines that would insure a life of productive activities. Through his foresight and wisdom a staff of eminently competent men was secured for the different departments, and Dr. Van Gieson was chosen as its director.

In his capacity as director of the Pathological Institute, Dr. Van Gieson brought to his work an already extensive experience in general pathology, an international reputation as a research worker, and a keen, alert, interested mind that grasped in a comprehensive way the wide ramifications in the collateral sciences of the psychiatry of that day. He formulated the details of Dr. MacDonald's original plans and built up in the institute departments of research along all the avenues of science that contributed to a knowledge of neurology and psychiatry. If there was any fault in his scheme at all it might be said that it was too broad, too comprehensive, and that the average man failed to see the utility of many of its parts.

Very shortly after the organization of the institute it plunged into active and productive work under the guidance and direction of Dr. Van Gieson, and so long as Dr. McDonald retained the presidency of the Lunacy Commission things went well. Unfortunately for the institute, however, and more unfortunately for Dr. Van Gieson, the administration of lunacy affairs in the State of New York changed hands and, as a result of this change, friction almost immediately arose, the final outcome of which was disastrous to Dr. Van Gieson.

Dr. Van Gieson can best be described in a few words as a genius. He knew none of the rules that applied to the average man. He had a keen and incisive mind, he was alert and full of interest in everything, but he possessed that sensitive organization which made anything approaching control from outside sources utterly unsupportable. He was a spasmodic and irregular worker, when he worked, working with a fervor and depth of distraction that made him utterly forget time, food and sleep, working for days and days without rest, way into the small hours of the morning. These periods of tremendous activity were followed by days of inactivity, during which he did nothing, and sometimes was entirely inaccessible, not even attending his office. He was, however, tremendously productive. During the few best years of his life he gave a great number of valuable articles to medical literature. His work on "artefacts of the central nervous system" is still a classic, while to-day, considerably over ten years after he has ceased to do any active, productive work, one still sees his name frequently in the scientific literature of the world, while when he lived he was easily the best known in Europe of the American pathologists of the central nervous system.

With the change of the administration of the institute, and with Dr. Van Gieson's wise adviser and balance wheel gone, there came a new order of things, a new order that demanded that Dr. Van Gieson should be measured with the rule that was applied to the average man. Administrative methods changed. The director should be in his office at certain hours, he should do certain things at certain times, and the high scientific ideals of the institute must occasionally be laid aside for the more practical purposes of supplying information in matters of hospital administration. Dr. Van Gieson was not an average man and he could not live

under conditions prescribed for the average man, and therefore the inevitable thing happened. After a long period of storm, which one can only look back upon with the deepest regret, the institute was temporarily torn to pieces and Dr. Van Gieson was forced from its directorship. The institute had become as the breath of his nostrils, it was his very life, and when he was torn away from it he was torn away from the source and the object of all his interests. He never survived the shock, he never was able to recover, and he never again did consecutive, productive work.

Such is the story of one of the most brilliant minds that this country has seen in the department of mental medicine. Dr. Van Gieson's physical death is only an incident in the tragedy of his life.

WILLIAM A. WHITE.

GEORGE S. ADAMS, M. D.

Dr. George S. Adams, former superintendent of Westborough State Hospital, Massachusetts, died at Stamford, Connecticut, on March 16. Dr. Adams had been ill for three days from an attack of influenza when the exacerbation of an old nephritis resulted in a uræmic coma which was rapidly fatal.

He was born of Scottish parentage at Norwich, Connecticut, February 7, 1848.

As an assistant physician he began his work among the insane at Westborough, in 1886, coincident with the opening of the hospital, and five years later, on the resignation of Dr. N. Emmons Paine, was promoted to the superintendency. During the twenty years which followed his appointment as head of the institution, the affairs of the hospital were administered with great ability, and in this long and worthy service was reflected much of the best American institutional care of the insane. After a service of more than twenty-five years at Westborough State Hospital, Dr. Adams resigned last May to become medical director of Dr. Givens' Sanatorium at Stamford, Connecticut.

For twenty years he was a lecturer on clinical psychiatry at Boston University. This is a record all the more noteworthy when one remembers how limited had been his early training in the schools. Beginning life as a journeyman machinist, he edu-

cated himself by his wide reading and through the night schools. At the age of twenty-eight, in 1876, he was graduated from Hahnemann Medical College, Philadelphia. Save for the first two years, all of his professional life up to the middle of 1912 was spent in Massachusetts. He had been in general practice ten years before he entered the branch of medicine in which he has left behind a record of such fine service. Though an executive of acknowledged ability, those who were closest to him professionally think of him at his best as an able and kind-hearted physician, always interested in whatever made for progress in medicine, resourceful, stimulating to his co-workers and beloved by his patients.

Half-Yearly Summary.

CALIFORNIA.—The State Lunacy Commission has recommended the repeal of the law authorizing the commitment of inebriates to state hospitals, and the establishment of a special institution for their care. It also recommends that a new state hospital be built in Southern California to relieve the congestion in the existing state hospitals.

COLORADO.—*Woodcroft Hospital, Pueblo*.—This hospital has added two sleeping porches, 16 x 50 feet each, to its infirmary building. They are of colonial design, enclosed with pickets up to the porch rail, above that with steel sash 6 x 10 inch lights, protected transom openings on three entire sides. This night care for the sick insane is expected to add to their comfort at least.

The department of occupation has been extended at this hospital to care for a large percent of its patients during the past year.

CONNECTICUT.—The Connecticut Society for Mental Hygiene held a Mental Hygiene Exhibit and Conference at Woolsey Hall, Yale University, New Haven, January 6-11, 1913. The traveling exhibit of the National Committee for Mental Hygiene was the chief feature of the exhibit. Four public meetings were held at which addresses were made by those prominently connected with the mental hygiene movement. In addition six informal meetings were held under the charge of Dr. Albert C. Thomas, formerly assistant physician at Connecticut State Hospital at Middletown, where the exhibit was explained, questions were answered, and stereopticon views shown.

ILLINOIS.—Efforts are being made to establish an inebriate colony, a bill for this purpose having been prepared by State Senator Edmond Beall. The bill provides \$250,000 for the purchase of a site and the erection of buildings.

The establishment of a colony for epileptics has been recommended by the State Board of Health.

During the latter part of January, 1913, the National Committee for Mental Hygiene's Exhibit was in Chicago and a number of public meetings were held.

—*Anna State Hospital, Anna*.—A cottage to accommodate 64 chronic women patients is now under construction and will cost \$50,000.

The new \$65,000 kitchen and bakery was occupied in January after a period of construction of over a year.

Bids have been advertised for the installation of a new water supply system. It is planned to dam a small stream about four miles from the hospital, to pipe the water to the hospital where a purification plant will be installed.

The driveway to town has always been a source of danger as it crosses a wide ravine over which there is a narrow high grade for a roadway. During the past year a concrete retaining wall, 475 feet long and 27 feet high at its highest point, was built and the driveway was widened with patients' labor. The total cost was \$2000 which was \$4000 less than if built by contract.

—*Chicago State Hospital, Dunning.*—The Board of Administration has approved plans for two buildings which are to replace those recently burned. The cost of each is \$50,000.

—*Peoria State Hospital, Peoria.*—The complete reconstruction of the heating plant and the change from water to steam enabled the institution to pass the first winter in comfort since it was built.

The Men's Dormitory and Staff Quarters are now occupied. This building, together with the Nurses' Home, gives magnificent quarters for all of the resident employees. The cottages occupied heretofore by attendants have been restored to the patients, thus affording excellent housing for 2200 patients.

A farm colony building, one mile from the institution, with a capacity of 50 patients, is completed and an active summer's work on the farm will result.

A herd of 70 dairy cattle, raised in other Illinois institutions, is sheltered in the newly built dairy barn.

The patients of this institution, unaided by paid help, raised 3000 chickens last season and 1000 laying hens were retained through the winter. Each of the 30 cottages and wards of the institution has its flock and its own poultry house and it is expected that this industry will be greatly extended the coming year.

Scarlatina was prevalent during January, February and March and the Hospital for Consumptives was relieved of its occupants and converted into a very serviceable contagious disease hospital. The disease was of a rather mild type but very persistent. It proved fatal in one instance. Many attendants and several patients also had measles.

This hospital is in its 12th year and has 1070 female patients, yet it has never had a suicide on the female side in its entire history.

—*Kankakee State Hospital, Hospital.*—A warehouse for tools has been completed at a cost of \$5000.

A new steel truss macadamized roof is being placed over the engine room because the old roof with wooden trusses had become unsafe.

Brooders and other chicken houses have been erected to accommodate 11,000 chickens; this supply is expected to furnish the hospital with fresh

eggs during most of the year, and also to give a large killing flock during the autumn holidays.

Several registered Holstein yearling heifers have been added to the herd, and also a registered Holstein bull; all cows giving less than 5000 pounds of milk per year have been eliminated from the herd which is being rounded into very good shape.

The cholera decimated the herd of pigs but prompt treatment with serum and vaccine prevented further loss. There are 600 head remaining.

During the spring flood the Kankakee River rose nearly ten feet, establishing a new flood record, but did no serious damage at the institution, although at one time the water was a foot deep on the pump-house floor.

Preparations for the spring work are under way and the lumber has been cut for remodelling Cottage No. 4 South, in the interest of better ventilation, more complete oversight of the patients, and incidentally to increase the capacity of the cottage by 25 beds; the latter, valued at \$600 per bed compensates two or three times over for the expense of the alterations.

The plans for a new steel truss roof on the pump-house are being completed, and the work will be done during the early part of the season.

A large gang of patients is digging trenches and laying sewer tile ready for the new laundry which it is expected the present legislature will give in place of the one burned a year ago.

Another large gang of patients is excavating for the nurses' cottage, the contract for which has just been let to John Moroff & Son, a local contractor.

Still another party of patients is being organized to begin the excavations for the continuation of the conduit system which was mentioned in a previous report. This conduit system is now about one-half completed, and it is hoped to have the entire system finished this year. These, it will be remembered, are to accommodate all water, steam and electric lines in roomy surroundings; at present these lines simply run promiscuously under the lawn or through dangerous tunnels actually too small for a man to get through.

The three main kitchens, each supplying food for 1000 patients, and the officers' kitchen, have had the woodwork painted and the walls and ceilings whitewashed.

The bakery has been remodelled, the old floor is being torn out and replaced by terrazzo tile; a spray bath, lavatory, sink, etc., provided in an attached side room; the old flooring and other woodwork torn out from another side room, provides a brick-lined room capable of holding two carloads of flour; an entire new set of working tables, sponge tubs and other utensils is supplied; electric light wiring and fixtures have been made entirely modern; new iron doors of modern construction and overhead hoods are supplied the ovens; the ovens have been rebuilt in their entirety; electric motors have replaced water power motors, and all the woodwork painted and the upper walls and ceilings whitewashed.

It is planned to lay hundreds of feet of sidewalk and curbing this year, and a concrete mixer with gasoline motor attachment is about to be purchased.

Ornamental shrubs and trees have been purchased to the value of several hundred dollars and are being set out.

The following buildings have been requested of the State Board of Administration and the appropriation will be recommended to the legislature by the board.

A laundry building to cost \$35,000, the old one having been burned a year ago.

Steel truss roof for boiler house, \$18,000, the present roof having been condemned.

Two cottages for tuberculous patients.....	\$20,000
Contagious disease pavilion.....	10,000
Cow barn	15,000
Building for male employes now rooming on the wards.....	90,000
Blacksmith shop	6,000
Warehouse for tools.....	10,000
Brine system for cold storage to replace ammonia system.....	3,500

The board also recommends for this hospital, \$1000 for horses; \$20,000 for improvement of the water system; \$1,750 for building a tunnel; \$15,000 for iron radiator covers; \$1,200 for a domestic hot water heater; \$1,600 for a pressure tank for elevators; \$3,500 for additions to the dairy herd.

In the way of ordinary operating expenses for 1913, the board recommends an appropriation of \$445,570; and for ordinary operating expenses for 1914, \$512,089.

In the way of ordinary repairs and improvements, the board recommends an appropriation of \$64,000 for each of the two years, or \$128,000 in all; and for care and improvement of the grounds, the sum of \$2,500 per year. The total appropriation recommended for buildings and permanent improvement for two years amounts to \$251,550. For maintenance and ordinary operating expenses, \$957,659, and for ordinary repairs and improvements and care of the grounds, \$133,000. Grand total, \$1,342,209.

On the medical side it can be stated that during the past six months this hospital has admitted on the average five patients per day; in consequence the population has risen to more than 3,050 patients, representing an overcrowding of about 40 per cent. Still, there have been few serious accidents, and it is a pleasure to report that but one suicide has occurred, even under these trying circumstances. The staff has been added to in view of the increased population, and the following physicians have entered the service within the past six months: Dr. E. C. Pratt, Dr. Otis Like, Dr. Walter A. Ford (Interne), Dr. Walter C. Cook. There have been no resignations. During this semester there have been admitted 760 patients, 251 patients discharged and 151 patients paroled. More than half the patients come from Cook County, and a like proportion of the

paroles and discharges are from that county and these are all paroled into the custody of the Mental Hygiene Society. One of the officers visits the office of the society every two weeks to see such patients as the institution desires to have call there or the society thinks best to have examined.

INDIANA.—*Indiana Hospital for Insane Criminals, Michigan City.*—This hospital was opened for occupancy October 16, 1912. It consists of one building, the plan and equipment of which is thoroughly modern.

—*Southern Indiana Hospital for the Insane, Evansville.*—The new psychopathic hospital was completed at a cost of \$85,000. It was opened for public inspection November 15, 1912, and is now occupied. It contains 30 beds for men and the same number for women.

Commodious operating rooms are provided with a complete surgical armamentarium of latest approved type. Duplicate equipment for hydrotherapy is installed in additional wings from the main building. A large solarium is provided for each of the wards.

The kitchen is supplied with an electric range and all food is cooked by this means.

A modern sanitary dairy barn has been built and the institution has acquired a herd of thoroughbred and high grade Holstein cattle which are yielding excellent results.

One hundred acres of adjoining land has been added to the hospital tract.

—*Northern Hospital for Insane, Longcliff, Logansport.*—Staff meetings are held weekly. A thorough system of clinical note taking and making special examinations has been worked out and is being used by all members of the staff.

The pathological department, under the direction of Dr. B. H. Landis, is making routine examinations of urine, blood and sputum and preparations are being made for a routine Wassermann.

A certain number of selected cases of epilepsy are being treated with Crotalin with gratifying early results.

The last legislature appropriated \$45,000 for new congregate dining rooms for men and women, \$6000 for new boilers, \$6000 for new loggias, \$12,000 for a new dairy barn, \$1500 for a new bake oven.

KENTUCKY.—*Eastern Kentucky Hospital for the Insane, Lexington.*—The patients in this hospital were recently examined for hookworm. The investigation was made by two experts under the direction of the State Board of Health, at the expense of the Rockefeller Foundation.

—*Western Kentucky Hospital for the Insane, Hopkinsville.*—There have been no changes in the treatment of patients in the last year, but a closer

application of the old methods has been insisted upon and practised. By the old methods are meant those which were adopted about three years ago when the institutions of Kentucky, under the advice of the Governor and Board of Control, attempted, through the various superintendents, to do away with all forms of restraints. This was accomplished in about 12 months, and is rigidly enforced in this institution at the present time. Kindness and individual attention at the hands of trained nurses, directing and interpreting the impulses and peculiarities of the patients together with mental and physical employment of various kinds have proved far more satisfactory and have given better results.

A tubercular colony has been completed and is occupied by about 50 patients. This colony is composed of a center building and seven open air tent houses built on the order of the Nordwack Sanitorium. This has been completed about 18 months and has given even greater results than anticipated.

The organization of the medical staff is as follows: A staff meeting is held twice a week, before which meeting are brought all patients received for mental and physical diagnosis, which diagnosis is made according to the Kraepelin classification. The medical staff has a meeting in the form of a society once a week, before which a paper is read on mental diseases by one of the members.

Modern equipment for hydrotherapy is being prepared, as it has been found very efficient in the treatment of certain forms of insanity.

MARYLAND.—A Mental Hygiene Congress was held by the Medical and Chirurgical Faculty, February 24 to March 1, 1913, at Osler Hall, Baltimore. An afternoon and an evening session was held each day at which stereopticon talks were given and addresses of a helpful character. Considerable interest was shown in the meetings by the general public, the attendance at each meeting averaging about 350. The exhibit of the National Committee for Mental Hygiene was prominently featured and attracted much attention but the occupational exhibit by the various hospitals proved very interesting. It was considered the most successful effort for public instruction that the faculty has made. A special effort was made to familiarize the public with the methods of care of the insane and prevention of insanity. Special emphasis was laid upon recreation, eugenics, education, alcohol and immorality in their relations to mental hygiene.

A Mental Hygiene Committee has been appointed by the Maryland Psychiatric Society, consisting of Dr. Adolf Meyer, chairman, Drs. A. P. Herring, J. C. Clark, J. Percy Wade, R. P. Winterode, and E. N. Brush and Messrs. J. W. Magruder, N. G. Grasty and Louis H. Levin. Dr. W. B. Cornell is executive secretary. At present the committee is making a trial of family care as well as filling the other functions of mental hygiene.

—*Sheppard and Enoch Pratt Hospital, Towson.*—The trustees of this hospital have planned to celebrate the 60th anniversary of its incorporation by holding a meeting on the afternoon and evening of May 8, and the afternoon of May 9, at which addresses will be made and papers read by members of the staff both past and present, and a number of invited speakers. A dinner to a limited number will be given on the 9th. On the 10th a field day will be held by the patients and men nurses.

MASSACHUSETTS.—The Massachusetts Society for Mental Hygiene has planned an exhibit and conference with the National Committee for Mental Hygiene to be held in Boston during the early part of April.

—*Taunton State Hospital, Taunton.*—Since the last report no new work has been finished, but some new work has been commenced.

At the present time a kitchen and dining room building is under construction at the Raynham Farm Colony which will permit caring for about 25 more patients, bringing the number of that unit up to 100. There is also being constructed a colony group of buildings to accommodate 100 women on another piece of land belonging to the hospital but detached from the main plant.

These two undertakings were commenced the latter part of 1912 and are expected to be finished in the early fall of 1913.

—*Boston State Hospital, Boston.*—The following construction work is under way at this hospital, appropriations having been granted last year:

Ward building for 120 women patients, building for general stores, cold storage, and bakery, addition to electric light plant.

A home for 42 male attendants is completed, also alterations and improvements in south wing of Fisher Group. Following a comprehensive plan for development of the institution, adopted in 1909, special appropriations are requested of this year's legislature for several additional buildings and other improvements.

The past year has been a busy one. The Infirmary Group, accommodating 345 patients, was opened in March, 1912, and the Psychopathic Department on Fenwood Road was opened in June. The capacity of the institution is increased to 1200 exclusive of the Psychopathic Department, where 100 beds are available for an active admission service, partly of committed cases, but to a very large extent of patients detained for temporary care and observation or admitted on the voluntary basis. During the past year the services of a field worker in heredity have been supplied by the Eugenics Record Office, and this research is being continued in connection with the social service work in the Psychopathic Department.

The training school course has been extended to include six months general hospital training, obtained through affiliation with the Boston City Hospital.

—*Gardner State Colony, Gardner.*—One cottage for 30 men patients was completed and opened early last December.

Two small cottages to accommodate 16 male patients each are well along and will be ready for occupancy early this summer.

During the winter a toy manufacturing department has been started at the Men's Industrial Building and the interest shown by the patients is remarkable.

A small gymnasium has been fitted up at the Women's Industrial Building, and also a culinary department where patients are taught to cook and serve lunches to the other patients daily.

Over 90 per cent of the patients are employed in some useful occupation and they appear to be interested and happy.

—*The Norfolk State Hospital, Norfolk.*—This is a new hospital for the treatment of inebriety and drug habituation, which is being established in the townships of Norfolk and Walpole. The tract of land purchased comprises approximately 1049 acres of cleared and wooded land. The site, made up of hills and low lands, is well adapted for its purposes. The hills, composed largely of broad ridges, allow for natural building sites, while the low lands and valleys are to a considerable extent cleared land affording sites for farms and for agricultural development. The land is abundantly supplied with springs and the State Board of Health has reported that an adequate water supply and an efficient sewerage system can be established at a small expense.

The section of land on which the main hospital buildings are being erected is in immediate contact with the Wrentham branch of the New York, New Haven and Hartford Railroad, 26 miles from Boston, and only a few miles distant from the towns of Wrentham and Walpole.

Approximately one-third of the acreage, 312 acres, has been at one time under cultivation. The cleared land will readily serve as a nucleus for the farm colonies.

\$38,789.45 has been expended for the purchase of land, averaging \$37 per acre, which includes farm houses and detached buildings. The amount remaining after the purchase of the land has been used for necessary expenses in repairing buildings on the property, and for a complete topographical survey of the entire acreage. A small sum has been held in reserve for the purchase of several small parcels of land under consideration.

Two farm houses near the boundaries of the tract of land have been repaired, and since August 1, 1911, a daily average of 50 patients have lived at these colonies and have been supported by separate maintenance (chapter 754, Acts of 1911). These men have been employed at construction, general repair work, and in the harvesting of crops. The houses are in a sanitary condition and will serve as permanent living quarters. A house with detached buildings in the center of the tract of land is being used as a residence for an assistant physician and his family.

Service buildings and six cottages are now being erected.

MICHIGAN.—A number of bills have been introduced into the legislature, now in session, that are of interest to the state hospitals. A bill providing for the sterilization of defectives will probably pass both houses, and receive the approval of the Governor. It is not possible, at this date, to predict the final form which the measures will take.

Other measures having to do with the commitment, and the care of the insane are receiving attention from the legislature. Among these may be enumerated an effort to secure greater facilities for the reception into state hospitals of voluntary patients; also a modification of the terms by which inebriates may be detained.

It seems likely that separate provision will be made for the care of epileptics by colonizing them in a new institution.

A civil act will receive attention. If passed in the terms in which the bill is introduced, state institutions will come under the act. Another bill has for its object the abolition of local treasurers for the various institutions, and providing for the payment of all obligations by warrants on the state treasury.

—*Pontiac State Hospital, Pontiac.*—The legislature has been asked for an appropriation of \$62,000 for an infirmary building for men; also for \$15,000 for a cold storage plant; also for \$15,000 for a home for night nurses.

The above constitutes the only contemplated addition to the plant, or to its equipment.

—*Kalamazoo State Hospital, Kalamazoo.*—This hospital is contemplating the installation of a water softening plant, provided the present legislature grants the \$7000 requested for this purpose. It is hoped also to secure from the legislature an appropriation of \$8000 to enable the institution to acquire the Montague estate adjoining the hospital grounds.

MINNESOTA.—It is reported that the State Board of Control will convert the old Stillwater Penitentiary into a hospital for criminal insane.

NEBRASKA.—*Nebraska State Hospital, Ingleside.*—This hospital has within the past few months completed two small but very complete hydrotherapy rooms, one in the men's, and the other in the women's department.

A new underground tunnel 7 x 7 feet, of concrete, with concrete floor, approximately 1500 feet long, and connecting by electric food elevators the general kitchen with all the hospital and ward buildings, has been completed within the past 60 days, is now in service, and provides a means of transporting food from the general kitchen to all buildings where patients are cared for.

At this time the institution has what is certainly the best pathological laboratory, and pathologist in the middle west. It is doing a large amount

of general pathological work, Wassermann and supplementary tests, Noguchi modifications, cobra venom, etc., and is under the direct supervision of Dr. H. G. Maul of the University of Denver.

A request is in the hands of the legislature, and seems to be received favorably by that body, asking for a \$50,000 appropriation for the erection of a modern tubercular cottage for the care of this institution's tubercular insane, which, if secured, will not only add very greatly to the security from tubercular infection of recent admissions, but will also provide a better means of caring for all tubercular cases. It is planned that the cottage will accommodate 50 men and nearly the same number of women.

NEW HAMPSHIRE.—*New Hampshire State Hospital, Concord.*—A new unit has been added to the hospital. This building will have at present a capacity of 212 patients, with accommodations for several employees. With one added wing the ultimate capacity will be 424 patients. There is a kitchen and a congregate dining room for the patients. As far as possible the patients will be of the industrial class, the men comprising those who work on the farm, in the laundry, and shops, and the women including those who are employed in various capacities about the institution.

A legislative appropriation has been asked for, and if granted a new carpenter shop will be erected near the power station. The old power station is already being made over into an industrial building. The first floor is used as a paint shop where from ten to twelve men patients are employed. On the same floor is another large industrial room where printing, rug, and brush making are carried on. As soon as the carpenter shop can be moved to its new location the second floor will be finished into industrial rooms for broom making, cobbling, and shoe making, and upholstery. The mattress and broom making are now carried on in another building. By these changes all the various men's industries will be segregated in the one building which will be made as nearly fire-proof as possible, with granolithic floors and brick walls.

The third year in the Training School Course has proved to be a wise addition to the curriculum. During this year the third-year students who have demonstrated their fitness serve out their allotted time in the hospitals and district nursing association with which the State Hospital is affiliated. During this third year also the nurse serves two months in the hospital diet kitchen. The lengthening of the course gives the nurse ample time in which to gain her practical experience in surgical and obstetric nursing, and sick room cooking.

NEW JERSEY.—During the week of February 10, 1913, the exhibit of the National Committee for Mental Hygiene was held at Princeton where it excited considerable interest.

—*New Jersey State Hospital, Morris Plains.*—In continuance of the endeavor to procure a pure water supply and to have the water from this source easily accessible, a pipe has been laid from a spring on the mountain behind the hospital to a specially equipped house where the water to be used for drinking purposes throughout the hospital will be bottled under hygienic conditions and close supervision.

The new kitchen at the main building was opened on March 3, after having been a source of contention between the Board of Managers and the contractor for nearly two years because the latter would not complete his contract according to its specifications.

The building for patients suffering with tuberculosis was opened on February 1 and is being used for male patients.

The nurses' home for men is completed but must be furnished before being occupied. This will be done during April.

Electric wiring of the main building was begun in November and is nearly completed. The contract for fixtures has not yet been awarded.

Work on the installation of new boilers was begun in January and is to be finished by May 15. Fortunately the past winter was a mild one, and no suffering followed the tardy commencement of this important and necessary undertaking. Contracts were awarded in March, the work to be commenced in April for an enlargement of the laundry, an addition to the home for women nurses, and a new accessory dairy barn.

No changes in the staff occurred during the last six months, but a resident dentist was employed two months ago.

Moving pictures have been given at least every two weeks during the winter. They are looked forward to by the patients, and have a marked beneficial effect on nearly all who are able to be present.

Plans for a two-story building to house workshops for both men and women have been prepared by the State Architect, and have been duly approved. Bids for the erection of this will be advertised for in the near future. A room has been fitted up temporarily where raffia work, embroidery, arts and crafts, hand painting, etc., are being done by the patients.

The overcrowded condition is continually becoming more serious. There are 720 patients in excess of the normal capacity. In the last annual report a request was made that if nothing else be done a commission be appointed to enquire into this state of affairs and report to the Governor. The recovery rate is decreasing and the death rate growing larger, both of these apparently being due to the overcrowded condition of this hospital which prevents proper classification and segregation of patients.

Steps are being taken in connection with the United States Bureau of Immigration to return all aliens whose insanity is due to causes existing prior to landing and who have not been in the country three years, and also to return to other states those not having a legal settlement in New Jersey.

A large hospital exhibit was sent to the New Jersey Conference of Charities and Corrections at Plainfield and also to the Conference on

Mental Hygiene at Philadelphia. The exhibit consists of "heredity charts," photographs of laboratory findings, charts showing at a glance a person's mental condition throughout life, recovery rates, percentage of persons admitted suffering from each psychosis, photographs of buildings and methods of treatment, pointed epigrams showing the causes of insanity, necessity for early treatment, and prophylactic measures likely to prevent such conditions. This exhibit was prepared at considerable expense and much time by the officers of the hospital.

In addition to the scientific material gathered together in this exhibit a quantity of patients' work has been included in it to give the public an idea of the means employed in the re-education of patients. This exhibit is to be shown throughout the state in an endeavor to interest all serious-thinking people in the problem of better state care of dependents and the necessity of more pronounced preventive measures if the number of insane persons is to be diminished and also to show what is now being done with the limited means at disposal to aid the insane.

NEW YORK.—During November, 1912, an exhibit and conference was held by the National Committee for Mental Hygiene in conjunction with the adjacent state hospitals and individuals interested in this subject. The meeting was a most successful one and an appeal was made to create an endowment fund of \$200,000 to enable the committee to extend its research work to many localities.

A clearing house for defective children was opened October 22, 1912, at the Post-Graduate Hospital, New York City, under charge of Dr. Max G. Schlapp. It is believed that it will accomplish much good.

—*Letchworth Village, Thiells*.—Contracts have been made for the construction of four dormitories, an attendants' home, dining hall, laundry, power plant, and storehouse at Letchworth Village, the new state institution for feeble-minded and epileptic.

—*Matteawan State Hospital, Fishkill-on-Hudson*.—A new ward is nearing completion for the women patients. A new coldstorage plant is about to be constructed.

—*Rochester State Hospital, Rochester*.—Fifty acres of farming land, with a farm-house, contiguous to the present hospital property, have been purchased.

Plans for an additional Nurses' Home and improvements to the Lake Farm Cottage, on the shores of Lake Ontario, are being prepared.

—*Buffalo State Hospital, Buffalo*.—The new pavilion for contagious diseases, erected on the grounds, was opened for the care of patients with contagious diseases December last, and can accommodate about ten. The building is in bungalow style and so arranged that it can be divided, not only to care for men and women, but also sub-divided to care for different forms of contagious disease, in larger and smaller numbers, etc.

A building on the bungalow plan, for cases of tuberculosis among men, has been planned, and will undoubtedly be commenced this spring, provided supplemental appropriation therefor is passed by the legislature. This building will form a counterpart to the pavilion for women, erected a short time ago.

The lakeside farm and colony on the shores of Lake Ontario, at Wilson, N. Y., which for four years has been a very important and efficient aid to recovery in patients, has been lost to the hospital, as the lease expired and the property was sold. The bill providing for its purchase failed to become a law, and this lakeside resort, much-beloved by the patients, passed into other hands. No new location has as yet been selected.

An electric water purifying apparatus has been installed at the hospital.

—Hudson River State Hospital, Poughkeepsie.—Work progresses on the new additions to the hospital. The extension at Edgewood, comprising Wards 46 and 47, is enclosed and requires only flooring and trim. This applies to the additions to the Reception Hospital and both will provide greatly needed accommodations for disturbed patients.

As the Hudson River State Hospital Training School is registered and supervised by the State Education Department, a suggestion of that department has been met by the establishment of a lecture and demonstration room in the main building. Heretofore the class lectures have been given in the waiting room of the clinic and the two activities frequently have conflicted. With training school work, and instructions to the recently employed attendants, the lecture room will be put to good use.

The arts and crafts class also has been supplied with a satisfactory workroom in the industrial block. The quarters are light, pleasant, sufficiently removed from the wards, and yet accessible without exposure to inclement weather. This feature of hospital activity has received considerable attention during the past three years. Trained instructors make an effort to supply diverting occupation for those patients who, by reason of mental and physical infirmities, are unable to take part in other forms of occupation, and it is desired to make these workrooms as attractive as possible.

Pleasant accommodations for forty women nurses have been furnished by the finishing of the third floor over Wards 7 and 8. With the greatly increased population of the hospital many of the wards were overcrowded and rooms for the additional nurses could be found only by taking single rooms on the wards. Keeping the room doors closed made the wards dark, but the accommodations for the forty additional nurses will in a measure relieve some of the overcrowding and supply comfortable and homelike quarters for the nurses.

The hospital having outgrown the accommodations of the steward's office, the work of that department for several years past has been done in a space entirely inadequate, a two-story extension 25 x 25 has been planned and the work will be started as soon as the weather permits.

The new water line under construction for the past six months is in a fair way to be completed this spring. With the installation of a sedimentation basin which is a part of the work under contract, the filter beds will have much less work to do and will not require the frequent cleaning which interferes with their present efficiency.

—*St. Lawrence State Hospital, Ogdensburg.*—Considerable work is being done along the line of psycho-analysis. This with patients in the hospital, and psycho-neurotics requesting aid at the dispensary.

Moving pictures weekly continue a pleasing form of entertainment for the patients, the reels being carefully selected for suitable pictures.

The new carpenter and blacksmith shop has been completed. This gives decidedly more room and should add to the efficiency of the work. Prior to removal to the new quarters, the shop was located over the dynamo room—a decidedly dangerous location in the event of fire occurring.

The new incubator and brooder has been completed, allowing of more profitable poultry raising.

An old barn has been remodeled, providing quarters for young cattle.

The new root cellar is completed. This will allow for a more economical storage of vegetables.

The industrial department has manufactured numerous cement blocks for building an ornamental cement wall on the hospital boundary line.

—*Utica State Hospital, Utica.*—In October, 1912, the hospital acquired a tract of 932 acres of land in the town of Marcy for a new site. Two farm colonies have been established there and active agricultural operations are in progress. New buildings have not yet been started but several of the structures already on the property have been altered to accommodate patients.

A vocational school in charge of a trained instructor has been established.

The county of Onondaga has been added to the district of this hospital.

A transfer of 50 women patients was made to the St. Lawrence State Hospital on March 11, to relieve the overcrowding which prevailed in this institution.

A cold storage and ice plant was completed recently and is now in operation.

On March 21 the hospital was visited by a cyclone and much damage resulted to the grounds and buildings. One of the large elms bordering the main drive was among the many trees that were blown down.

—*Binghamton State Hospital, Binghamton.*—Plans are practically completed for extensive renewals in the electric equipment of the hospital. The present lighting system was installed twenty years ago, and the "direct" current was made use of. The new plant will be the "alternating" system and the dynamos will be located at the general hospital

power plant on the bank of the Susquehanna River, instead of on the hill where now located. Plans are also nearly completed for an extensive addition to the laundry where facilities have been inadequate for a long time past. The proposed addition will be 45 x 80 on the ground and two stories high. Considerable new machinery will be installed.

An addition to the hospital bakery has been erected, which will provide on the first floor a large bread-room and on the second floor two rooms for employees. At the summer camp, known as "Pine Camp," as soon as the weather conditions admit, three small frame structures will be erected with shingle roofs and canvas sides, to replace tents no longer serviceable. The camp, with improved facilities, will be opened for about thirty patients the latter part of May, and will be conducted in the same general manner as in previous years.

Under the direction of the Bureau of Deportation, a number of foreign-born patients have been deported during the past six months. Nurses from the hospital have accompanied several parties of this character to England, Ireland, and Germany.

The hospital now cares for 2391 patients, whereas the certified capacity is 2110. To relieve the overcrowding the legislature has been urged to provide funds for a new building to accommodate 400 women. An excellent site for such a building is available and it is believed the construction could be accomplished at this hospital at lower cost than in any other part of the state.

Early in January Dr. R. R. Williams, an assistant physician in this hospital, was detailed for a two months' special course of instruction at the Psychiatric Institute, New York City, under the direction of Dr. August Hoch, the Director of the Institute. A number of physicians from other hospitals attended this course at the same time. The instruction dealt largely with psychanalysis in its application to the diagnosis and treatment of insanity, organic and functional disorders, the anatomy of the nervous system and aphasia. On his return to the hospital Dr. Williams was assigned to duty on the acute hospital service.

In October, 1912, a meeting of physicians from a number of the other state hospitals was held here, at which the medical member of the State Hospital Commission, Dr. James V. May; Medical Inspector, Dr. Walter G. Ryon; Director of the Psychiatric Institute, Dr. August Hoch, and Chief Associate in Neuropathology at the Psychiatric Institute, Dr. Charles B. Dunlap, were present. The meeting covered two days and many papers were presented, most of which have since been printed in the State Hospitals Bulletin.

—*Manhattan State Hospital, Ward's Island.*—The following is a list of improvements made during the past six months. These improvements, which were mentioned as being under way during the previous six months, are now completed: Installation of electric wires, underground conduit, heating system in female home, extension of roads and cement walks.

The rebuilding of the third story of the Psychiatric Institute has not yet been completed. The tin and iron gutters and leaders on dining room 4, addition to Staff House, Ward 20, storehouse building, kitchen 2, and the steward's cottage have been replaced with copper. The interior of Ward 59 and exterior of east building have been painted.

The following improvements are now under way: Compressor room at power house, camp for tubercular men, installation of therapeutic apparatus in two new cottages, the equipment of entire institution with new locks, addition to assembly hall and new mortuary.

One woman attendant is recovering from an attack of measles.

As mentioned in a previous report Central Islip receives approximately one-half of the patients committed from the Manhattan district.

—*Rome State Custodial Asylum, Rome.*—The enactment by the last legislature of a law granting to the institution the power to parole inmates and also a law allowing the reception of children for purposes of observation without formal commitment, have served exceedingly useful purposes in both particulars. Thirty-six paroles have been granted during the year, 26 boys and ten girls. Fifteen patients have been received for observation, eight boys and seven girls.

A recent decision of the Attorney-General relative to the retention and discharge of inmates not in indigent circumstances, has served to curtail greatly the power of the managers to retain, under the custodial law, many patients who should, for the good of the community as well as for the individual best interests, be retained in custody here.

The decision is based on one or more apparent defects in the organic law, which defects should be remedied by the incoming legislature amending the law wherein it provides only for the commitment of indigent cases, and also wherein it provides that commitments shall be made by the superintendent of the poor of the counties or commissioner of charities of Greater New York.

The law should be amended to provide for a judicial or court form of commitment of feeble-minded persons whether indigent or not, and such other legislative enactments as will give the managers permanent custody over such cases as should be retained in the asylum, for their own good as well as for the protection of society in general.

The manual training and physical education work has been materially extended during the past year to the great benefit of the inmates, especially of the lower grade, and to the general uplift of the tone of service throughout the institution generally. A larger variety of entertainments has been introduced, especially a moving picture machine, a number of phonographs, and a piano for every ward. Also, musical instruction has been extended to a much larger number of inmates, all of which greatly facilitates the matter of easier management, and especially more satisfactory discipline. The amusement, entertainment and diversion of inmates help to a great extent to keep them from getting into mischief and trouble, also to diminish greatly the amount of extreme discipline ordi-

narily required among inmates of this character, especially the delinquent feeble-minded class, of which a larger number than ever before have been received.

The farm colony idea is being extended further as it has proven very practical, as well as economical, in carrying on institution work of this character.

—*Craig Colony for Epileptics, Sonyea.*—Part of the new school building which has been constructed has been occupied since February 1, 1913. Regular classes are held in arts and crafts, manual training and ordinary school branches.

The new dormitory to replace the Six Nations Dormitory for male patients will be ready for occupancy about June 1, 1913.

Advertisements have been inserted calling for bids on a water softening and filtering plant to have a capacity of at least 200,000 gallons daily.

The third floor of Spratling Hall, the administration building at the colony, is being finished off into rooms for officers.

Plans are practically completed for the erection of four employees' cottages, a new barn to replace one condemned, the remodeling of the basement of the dairy barn and the erection of a cold storage plant in connection with the present store.

Aster and Bluet Cottages in the Villa Flora Group have been remodeled and replastered throughout.

The north subway, permitting the main highway to pass beneath the Pennsylvania Railroad tracks, is being materially improved by the erection of a new bridge and widening of the road.

There is continued difficulty in securing attendants, probably because of the isolation of the institution, the incomplete facilities for housing attendants and the low mental grade of many of the patients to be cared for, for which class the facilities are not as complete as they should be.

It is to be regretted that this institution was unable to secure the approval of the supervisory bodies for the employment of field workers, in co-operation with the Eugenics Record Office. The State Board of Charities created about two years ago a Bureau of Analysis, which ultimately will obtain for the colony much data in regard to heredity.

NORTH DAKOTA.—*State Hospital for the Insane, Jamestown.*—Present population 855, of which 531 are males and 324 are females.

Improvements contemplated (granted by recent legislature):

Receiving ward and hydrotherapeutic equipment.....	\$100,000
Tubercular building for men.....	100,000
New boiler house and equipment.....	65,000
Outside ward and farm building.....	30,000

Recently completed:

Female ward building.....	100,000
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Modern dairy barn with modern equipment, capacity, 125 cows.

Abattoir of up-to-date construction. Using which and buying cattle on the hoof has saved the institution a net sum of \$100 a month since installing.

OHIO.—*Massillon State Hospital, Massillon.*—Nothing particularly new is being exploited in this hospital. The new building, to be used for educational and diversional purposes, is almost completed. It is two stories, with high basement. In the basement there are billiard and pool tables, bowling alleys, tables for games of different kinds, and the shower baths.

On the first floor there is the school room proper, in which it is hoped to utilize common school methods, both for education and diversion. The services of a college man have been secured, whose affliction is so slight that it will not materially interfere with this work. There is also, upon the first floor, a large room which will be used as a library and reading room for the patients in the day time, and for the employees in the evening.

The second floor is a room 45 by 60 feet, which will be used for a gymnasium and drill room.

The whole idea of this educational and diversional building is yet to be wrought out, but it is hoped that great good will result to the patients.

PENNSYLVANIA.—A Mental Hygiene Exhibit and Conference was held in the City Hall, Philadelphia, March 15-22, 1913. The exhibit of the National Committee for Mental Hygiene was prominently featured but exhibits were made by the nearby hospitals and by several of the New Jersey institutions. The meetings were well attended and did much to arouse a general interest in mental hygiene.

—*State Hospital for Insane, Male Department, Norristown.*—At present the medical staff consists of one resident physician, four assistant physicians and one interne, the position of fifth assistant physician being vacant at this time.

The office building for the chief physicians is now almost completed and will be occupied in a short time.

The hydrotherapy building is completed and the apparatus is being installed. It will be ready for use during April.

On January 3, 1913, 67 criminal and convict patients were transferred from the male department to the State Hospital for Criminal Insane at Fairview, Wayne County. This affords great relief as the institution was not constructed to hold some of the more clever criminal patients. There are still 59 criminals and 49 convicts in the institution, who will be removed at a later date.

The industrial work, such as basket making, rug weaving, brass work, carpentry, and brush making, continues to be used as a therapeutic measure, especially during the winter months when employment out of doors is necessarily impossible.

An industrial building will be occupied during the coming summer and this will greatly facilitate the work.

The \$5000 appropriation for remodeling the tuberculosis cottage was found to be inadequate and was turned back to the state. The legislature will be asked for an appropriation for a new tuberculosis cottage and a reception building, both of which are much needed.

—*Warren State Hospital, Warren.*—The laboratory has been remodeled and the best modern equipment installed. An index system is carried on so that the pathological findings are readily available and the work of the clinician, eugenics field worker, and pathologist are correlated. The number of autopsies has increased to 85 in one year. Routine complement deviation tests for syphilis are made on every patient and, except for the feeble, all are immunized against typhoid fever. One hundred attendants have volunteered to be immunized. Since the routine immunization has been established one case of typhoid occurred and this was so mild that the diagnosis was only made positive by blood culture.

—*Eastern Pennsylvania State Institution for the Feeble-Minded and Epileptic, Spring City.*—Application has been made, to the legislature of the state of Pennsylvania, for sufficient funds to erect a number of buildings, in the department for women, as well as to provide quarters for the purely custodial cases, and a small hospital building. Up to the present time no hospital building has been provided, which is a necessity in a community of some 550 defective individuals.

This institution has taken an active part in the conference and exhibit on mental hygiene, held in the city of Philadelphia, on March 15-22,—not only in the line of exhibit, but in connection with the program as well.

The main aim of the training school, in this institution, has been to provide the greatest amount of training for the greatest number possible, and to provide such training as will be absolutely of use to the individual in his subsequent life in the institution, recognizing that the cases cared for are purely custodial cases. In the furtherance of this plan, manual training plays a great part in the school work. The child is taught to read and write, as well as the simpler forms of arithmetic, and these branches particularly in the terms of those things constantly at hand.

The new laundry building is about ready for occupancy, providing permanent quarters for this important work, as well as tailor shop, shoe shop, sewing and repairing rooms, etc.

The permanent power plant is also nearing completion, which will include the direct current plant for the central buildings, as well as an alternating section, supplying current to the outlying farm buildings, etc. This building also includes a cold storage plant, as well as coal storage and ash handling facilities.

—*State Hospital for Criminal Insane, Fairview.*—The board of trustees of this hospital has asked the legislature for an appropriation of \$2,000,000 to complete the buildings, and their equipment, and for maintenance.

RHODE ISLAND.—*Butler Hospital, Providence.*—In the work of the laboratory much has been learned in regard to the etiology of many obscure cases through the Wassermann test. This test is now made, of course, in all cases in which there is a history of syphilis, or in which there is reason to suspect a probable syphilis of the central nervous system. Much information has also been gained in cases of cerebral hemorrhage of obscure origin, and with the information at hand it is probable that a number of them are due to a syphilitic endarteritis.

A few cases of general paresis have been treated with salvarsan, followed a few hours later by lumbar puncture. A small amount of cerebral spinal fluid is withdrawn and an equal amount of the patient's blood serum is taken following the injection of salvarsan, and introduced into the spinal canal. In one case this has been repeated twice, but so far the data at hand are insufficient from which to draw any positive conclusions. This treatment will be given a trial, and in the light of the recent findings of the treponema in the brains of paretics by Noguchi and Moore, it is believed that anti-syphilitic treatment may, in the future, be of more avail in cases of tabes and general paresis than in the past.

One member of the staff has recently returned from Germany, after spending six months in Munich, and as the result of study and observation there, has called attention to a number of cases of "mixed" manic-depressive insanity. It is believed that in the "mixed" cases the psychosis continues longer than in those not presenting the mixed symptoms.

Occupation therapy for both men and women is holding a more and more important part in the hospital work every year, and the percentage of patients occupied is now greater than at any other time.

The William H. Potter Home for Nurses, costing \$79,000, was opened last November.

The hospital is now building a modern operating room.

UTAH.—*State Mental Hospital, Provo.*—A new dairy and horse barn is just being completed. It provides accommodation for fifty Jersey cows and sixteen horses. It is built of concrete and pressed brick and furnished with patent stanchions and feeding troughs. Rooms are provided for the farmers, complete with bath and toilet.

A new bake oven has been installed which has a capacity of 350 loaves per baking. A new range, steam cookers, and other apparatus have been installed in the kitchen. A new 72-inch mangle and an extractor have been installed in the laundry. The dairy has been equipped with a new barrel churn, cream vat, milk cooler, sanitary milk pails, Babcock milk-testing apparatus, and a new sink.

All of the buildings have been rewired by the engineering staff on the conduit system.

New maple floors have been laid in eight wards and in the Administration Building, and the remaining wards and rooms will be re-floored during the year.

A new concrete reservoir of 250,000 gallons capacity has been built and it is contemplated piping the water from an unfailing mountain spring in the canyon three miles distant which will give a pressure of 110 pounds.

A new section has been added to the greenhouse. A new piggery will be built.

Occupation continues to be extensively employed. Besides the regular industries, rugmaking, basketry, manual training, and a school room give ample opportunities for re-education.

Baseball, croquet, and passball are the chief out-door recreations, while a dance or entertainment each week, except during the summer, provides amusement when out-door games cannot be indulged in.

VIRGINIA.—*Western State Hospital, Staunton*.—A solarium has been built to the infirmary, also a building containing 100 single rooms, in which it is intended to place all noisy patients, consequently relieving the others who are more quiet. It is of brick, is three stories high and was constructed largely by patients' labor at a cost of about \$110 per bed.

About 5000 peach and apple trees have been planted during the past few years.

WISCONSIN.—*Milwaukee Hospital for Insane, Wauwatosa*.—Three story balconies, 80 feet long and 16 feet wide, have been provided on both wings of the hospital. These balconies have proven a veritable boon to the patients, enabling them to enjoy fresh air in all kinds of weather. During the hot spell in summer, the balcony doors were kept open all night and any patient desiring to go out on the balcony during the night was allowed to do so. One-half of these balconies are at present being enclosed in glass and open directly out of the alcove of each ward and are steam heated. They will form beautiful conservatories and provide a most attractive retreat for the patients on these halls. Three story balconies, 12 feet in width, facing the east and north at the end of the north wing, and east and south at the end of the south wing, were provided for the use of the patients on the back wards. Sleeping porches were constructed on these balconies which take the place of the old wooden porches which were torn down to make way for the new balconies. They are enclosed in glass, are steam heated, and are rather more commodious than the old porches, accommodating eight patients each, instead of three as formerly.

New plumbing has been installed throughout the hospital, the floors of the water closets and wash rooms laid in tile and the walls furnished with a tile wainscoting to a height of five feet. Concrete floors and asbestos

board ceilings were installed in all of the fire escapes and clothes rooms throughout the building. New sanitary floors have been laid throughout the short halls of the building and constitute one of the most satisfactory and sanitary improvements yet made.

Gas has been installed for cooking purposes in the kitchens and has proven advantageous in every way. The kitchens are comparatively cool now, particularly the officers' kitchen, which, under the old conditions was a source of great discomfort to the cook and the patients working with her, besides being free from soot. Small gas plates were also installed in the diet kitchens of the hospital wards.

Two Mitchell automobiles, one with tonneau deep enough to carry a patient on a stretcher, if necessary, were purchased last spring for the purpose of conveying patients from their homes to the hospital. When not in use, parties of patients are frequently taken for pleasure rides throughout the country and to the various city parks, and they seem to enjoy the diversion immensely.

A new hot house, 16 feet wide and 100 feet in length, has been erected and has been the means of supplying the patients with a liberal amount of fresh vegetables throughout the entire year, as well as affording healthful occupation for a large number of patients.

The electric wiring throughout the entire hospital was gone over and all defective wiring replaced. This wiring is enclosed in conduits.

A pavilion of split boulder construction was erected in the men's grove. This is not only a very substantial but very ornamental structure and was built by the carpenter assisted by patients. A concrete pergola east of the lake and adjacent to the lily pond and a broad terrace with ornamental balustrade overlooking the park and lily pond were constructed and add very materially to the beauty of the surroundings as well as affording a most beautiful view looking toward the east. This concrete pergola was exclusively the work of one of the patients, who exhibits great aptitude for work of this kind.

Cement blocks are being made for the foundation of the new bakery. This will be a two story brick building, the lower floor of which will be devoted to the use of the bakery, while the second story will be used for sleeping quarters for men employed on the farm, departments, night watches, etc., and will be the means of relieving the congestion in the north rear. The building at present used for the bakery will be given over to the laundry, where new modern machinery has been installed and where this additional space is greatly needed.

Appointments, Resignations, Etc.

- ADAMS, DR. FELIX M., appointed Superintendent of Eastern Oklahoma Hospital for the Insane at Vinita.
- ADAMS, DR. GEORGE SMITH, formerly Superintendent of Westborough State Hospital at Westborough, Mass., died at Stamford, Conn., March 17, 1913, aged 64.
- ADLER, DR. HERMAN E., appointed Chief of Staff of Psychopathic Hospital at Boston, Mass., June 1, 1912.
- ALDRICH, DR. EDWARD G., for thirteen years Assistant Physician at Buffalo State Hospital at Buffalo, N. Y., resigned October 10, 1912, and is at present residing in Warner, N. H.
- ALSPAUGH, DR. P. J., Second Assistant Physician at Massillon State Hospital at Massillon, Ohio, promoted to be First Assistant Physician.
- ANDERSON, DR. JOHN B., Medical Intern at Government Hospital for the Insane at Washington, D. C., promoted to be Junior Assistant Physician February 1, 1913.
- ANDERSON, DR. VICTOR V., appointed Assistant Physician with special duties in the Out Patient Department at Psychopathic Hospital at Boston, Mass., October 1, 1912.
- ANDREWS, DR. B. F., Third Assistant Physician at Craig Colony at Sonyea, N. Y., resigned February 1, 1913, to enter private practice in Rochester.
- ANDREWS, DR. WM. A., appointed Medical Intern at Binghamton State Hospital at Binghamton, N. Y., January 1, 1913.
- APGAR, DR. RAYMOND, appointed Medical Intern at Government Hospital for the Insane at Washington, D. C., March 23, 1913.
- ATHERTON, DR. C. C., Assistant Physician at Elgin State Hospital at Elgin, Ill., appointed Senior Physician at Lincoln State School and Colony at Lincoln, Ill.
- AUER, DR. EDWARD M., appointed Assistant Physician at Kalamazoo State Hospital at Kalamazoo, Mich., November 2, 1912.
- BARNES, DR. FRANCIS M., JR., Senior Assistant Physician at Government Hospital for the Insane at Washington, D. C., promoted to be Clinical Director October 1, 1912.
- BETOWSKI, DR. PAUL E., Junior Assistant Physician at Craig Colony at Sonyea, N. Y., transferred October 15, 1912, to be Assistant Surgeon at State Soldiers and Sailors Home at Bath, N. Y.
- BIGGS, DR. M. O., appointed Superintendent of State Hospital No. 1, at Fulton, Mo.
- BLACKMAN, DR. MARION E., appointed Medical Intern at Rochester State Hospital at Rochester, N. Y., October 1, 1912.
- BLES, DR. VICTOR A., appointed Assistant Physician at Elgin State Hospital at Elgin, Ill.
- BOOTHFIELD, DR. JAMES FRANCIS, formerly Assistant Physician at Westborough State Hospital at Westborough, Mass., died January 12, 1913, from influenza, aged 47.
- BORDEN, DR. PARKER G., appointed Medical Intern at Buffalo State Hospital at Buffalo, N. Y., March 17, 1913.
- BOSWORTH, DR. E. D., JR., appointed Assistant Physician to Out Patient Department at Psychopathic Hospital at Boston, Mass., October 1, 1912.
- BRADLEY, DR. W. P., appointed Superintendent of State Hospital No. 3, at Nevada, Mo.
- BRADY, DR. EMORY J., Assistant Physician at the Kalamazoo State Hospital at Kalamazoo, Mich., nearly nine years, resigned December 25, 1912, to become Assistant Superintendent at Newberry State Hospital at Newberry, Mich.

- BRIDGMAN, DR. OLGA, Physician at Illinois State Training School for Girls at Geneva, transferred to Lincoln State School and Colony at Lincoln, Ill.
- BRIGGS, DR. L. VERNON, appointed a member of the Massachusetts State Board of Insanity.
- BROWN, DR. SHERMAN, Assistant Physician at Kings Park State Hospital at Kings Park, N. Y., appointed Medical Superintendent of the Kenilworth Sanitarium at Kenilworth, Ill.
- BROWNLEE, DR. H. C., Assistant Physician at Texas State Hospital at Austin, resigned to be Field Director of the State Hookworm Commission.
- BUSEY, DR. A. P., Superintendent of State Hospital for the Insane at Pueblo, Col., appointed Superintendent of State School for Feeble-Minded at Arvada, Col.
- CHAMBERLAIN, DR. LESLIE, Assistant Physician at Warren State Hospital at Warren, Pa., resigned on account of illness.
- CHARLTON, DR. C. W., appointed Second Assistant Physician at Nebraska State Hospital at Ingleside.
- CHENEY, DR. CLARENCE O., Medical Interne at Manhattan State Hospital at Ward's Island, New York, transferred to Psychiatric Institute, January 1, 1913.
- CHILDS, DR. JOHN H., Assistant Physician at Manhattan State Hospital at Ward's Island, New York, resigned October 2, 1912.
- CLARK, DR. FRED. B., Superintendent of Chicago State Hospital at Dunning, Ill., resigned.
- CORB, DR. GARDNER N., Assistant Physician at Gardner State Colony at Gardner, Mass., resigned November 29, 1912, to become Surgeon on the Massachusetts Training Ship.
- COFFIN, DR. W. K., appointed Interne at Psychopathic Hospital at Boston, Mass., October 1, 1912, and resigned November 1, 1912.
- CONTER, DR. A. E., appointed Assistant Physician at Florida Hospital for the Insane at Chattahoochee.
- COOK, DR., Physician at Ohio National Soldiers Home at Dayton, appointed Third Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa.
- COOK, DR. WALTER C., appointed Assistant Physician at Kankakee State Hospital at Kankakee, Ill.
- CORNELL, DR. WILLIAM B., Assistant Physician at Danvers State Hospital at Danvers, Mass., resigned December 1, 1912, and appointed Executive Secretary of Mental Hygiene Committee of the Maryland Psychiatric Society.
- CORSON, DR. FRANCIS F., formerly Superintendent of New Jersey State Village for Epileptics at Skillman, died February 1, 1913, from heart disease, aged 65.
- COUCH, DR. MARY KATHERINE, appointed Assistant Physician at Northampton State Hospital at Northampton, Mass.
- CRICE, DR. J. T., Assistant Superintendent of Central Kentucky State Hospital at Lakeland, resigned.
- CRUTCHER, DR. W. H., appointed First Assistant Physician at Nebraska State Hospital at Ingleside.
- DARNALL, DR. R. F., Assistant Superintendent of Woodcroft Hospital at Pueblo, Col., resigned.
- DAVIDIAN, DR. HAGOP, Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to be Junior Assistant Physician, February 1, 1913.
- DAVIDSON, DR. A. J., appointed Third Assistant Physician at Central Kentucky Asylum for the Insane at Lakeland.
- DAVIS, DR. EUREY G., appointed Third Assistant Physician at Western Kentucky Asylum for the Insane at Hopkinsville.
- DENENDORF, DR. FREDERICK C., appointed Medical Interne at Manhattan State Hospital at Ward's Island, New York, November 30, 1912.
- DIXON, DR. FRANK H., appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., December 6, 1912, and promoted to be Junior Assistant Physician February 1, 1913.
- DOBSON, Assistant Physician at Worcester State Hospital, appointed Assistant Physician at Boston State Hospital at Boston, Mass., February 1, 1913.

- DOOLITTLE, DR. GLEEN J., appointed Medical Intern at Craig Colony at Sonyea, N. Y., October 1, 1912.
- DUNLAP, DR. CHARLES O'NEIL, formerly Superintendent of Athens State Hospital at Athens, Ohio, died February 13, 1913, from interstitial nephritis, aged 56.
- DUNN, DR. CLARA, Assistant Physician at Chicago State Hospital at Chicago, Ill., transferred to State Training School for Girls at Geneva, Ill.
- DUNNING, DR. RALPH H., Junior Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., promoted to be Assistant Physician March 18, 1913.
- DYNAN, DR. NICHOLAS J., Assistant Physician at Government Hospital for the Insane at Washington, D. C., promoted to be Senior Assistant Physician October 1, 1912.
- ECKEL, DR. JOHN L., Assistant Physician at Buffalo State Hospital at Buffalo, N. Y., who was granted a years leave of absence for study abroad, resumed his position October 1, 1912, having spent most of his time abroad in the clinics and laboratories of Berlin, Munich, and London. On December 15, 1912, he resigned to enter private practice in Buffalo, and to be Instructor in Neuropathology in the University of Buffalo.
- EMERSON, DR. L. EUGENE, appointed Special Examiner in Psychopathology at Psychopathic Hospital at Boston, Mass., October 1, 1912.
- EVARTS, DR. ARRAH B., Medical Intern at Government Hospital for the Insane at Washington, D. C., promoted to be Junior Assistant Physician February 1, 1913.
- EVERSOLE, DR. G. E., JR., appointed Assistant Physician at Psychopathic Hospital at Boston, Mass., Jan. 1, 1913.
- FARRAR, DR. CLARENCE B., formerly Assistant Physician at Sheppard and Enoch Pratt Hospital at Towson, Md., appointed Assistant Physician at New Jersey State Hospital at Trenton, March 1, 1913.
- FAST, DR. W. S., appointed Superintendent of Nebraska State Institution for Feeble-Minded at Beatrice.
- FITZSIMMONS, DR. T. C., appointed Superintendent of State Hospital for Criminal Insane at Fairview, Pa.
- FORD, DR. WALTER A., appointed Intern at Kankakee State Hospital at Kankakee, Ill.
- FOX, DR. HAROLD H., Medical Intern at Rochester State Hospital at Rochester, N. Y., resigned December 31, 1912, and appointed Assistant Physician at Gardner State Colony at Gardner, Mass.
- FREED, DR. JOHN W., Assistant Physician at Western State Hospital at Staunton, Va., resigned.
- FREEMAN, DR. G. H., Assistant Superintendent of St. Peter State Hospital at St. Peter, Minn., transferred to State Farm, Minn.
- GLASCOCK, DR. ALFRED, Assistant Physician at Government Hospital for the Insane at Washington, D. C., promoted to be Senior Assistant Physician October 1, 1912.
- GLUECK, DR. BERNARD, Senior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned November 30, 1912.
- GOODFELLOW, DR. T. J., Assistant Physician at Warren State Hospital at Warren, Pa., appointed House Officer of Eye and Ear Service at New York Post-Graduate Hospital.
- GREGG, DR. DONALD, appointed Assistant Physician to Out Patient Department at Psychopathic Hospital at Boston, Mass., January 1, 1913.
- GROVE, DR. L. W., appointed Assistant Physician at Bryce Hospital at Tuscaloosa, Ala.
- GUTTERY, DR. W. D., appointed First Assistant Physician at Nebraska State Hospital at Norfolk.
- HAGGERTY, DR. JAMES E., appointed Junior Assistant Physician at Craig Colony at Sonyea, N. Y., February 1, 1913.
- HALL, DR. ROSCOE W., Assistant Physician at City Detention Hospital at Baltimore, Md., appointed Assistant Physician at Phipps Psychiatric Clinic at Baltimore, Md.
- HASSALL, DR. JAMES C., appointed Medical Intern at Government Hospital for the Insane at Washington, D. C., March 1, 1913.
- HELM, DR. S. L., appointed First Assistant Physician at Eastern Kentucky State Lunatic Asylum at Lexington.

- HOLSHOLT, DR. A. W., formerly Assistant Physician at Stockton State Hospital at Stockton, Cal., appointed Superintendent of Napa State Hospital at Napa, Cal.
- HOLLOWAY, DR. HOWARD S., appointed Pathologist at Florida Hospital for the Insane at Chattahoochee.
- HOWELL, DR. WILLIAM L., appointed Medical Interne at Rochester State Hospital at Rochester, N. Y., February 10, 1913.
- HUEY, DR. EDMUND BURKE, Assistant in Psychiatry at Phipps Psychiatric Clinic at Baltimore, Md., has been given leave of absence to recuperate his health in California.
- HUGHES, DR. OLIVER F., appointed Assistant Physician at Elgin State Hospital at Elgin, Ill.
- JEFFRIES, DR. EDWARD FLEMING, Assistant Physician at Hospital for the Insane at Hamilton, Ontario, died October 17, 1912, aged 26, from typhoid fever.
- JENKS, DR. FRANK H., formerly Assistant Superintendent of Elgin State Hospital at Elgin, Ill., died December 24, 1912, from ulcerative endocarditis, aged 49.
- JONES, DR. KENNETH, Assistant Physician at City Detention Hospital at Baltimore, Md., resigned.
- KEMPF, DR. EDWARD J., formerly Chief Physician at Central Indiana Hospital for the Insane at Indianapolis, appointed Assistant Physician at Phipps Psychiatric Clinic at Baltimore, Md.
- KENNARD, DR. HENRY W., appointed Assistant Superintendent of Rosewood School for Feeble-Minded at Owings Mills, Md.
- KEYSER, DR. TEDROW S., Assistant Physician at Bloomingdale Hospital at White Plains, N. Y., appointed Assistant Physician at Phipps Psychiatric Clinic at Baltimore, Md.
- KING, DR. E. WARREN, Superintendent of Mendocino State Hospital at Talmage, Cal., resigned.
- KING, DR. ROBERT, Senior Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., transferred to Buffalo State Hospital January 19, 1913.
- KOCH, DR. J. VALENTINE, appointed Assistant Physician at Dayton State Hospital at Dayton, Ohio.
- KONRAD, DR. CHARLES WILLIAM, appointed Interne at Psychopathic Hospital at Boston, Mass., September 1, 1912, and resigned November 1, 1912.
- KROUT, DR. BOYD M., appointed Laboratory Interne at Psychopathic Hospital at Boston, Mass., February 1, 1913, and resigned March 26, 1913.
- KUHLMANN, DR. HELENE J. C., Woman Physician at Buffalo State Hospital at Buffalo, N. Y., elected President of Women's State Medical Society of the State of New York.
- KÜNSTLER, DR. MAX, appointed Junior Assistant Physician at Craig Colony at Sonyea, N. Y., November 15, 1912.
- LADOVA, DR. ROSALIE M., Woman Physician at Northern Hospital for the Insane at Winnebago, Wis., resigned.
- LAFORA, DR. GONZOLA R., Histopathologist at Government Hospital for the Insane at Washington, D. C., resigned August 31, 1912.
- LA MOURE, DR. HOWARD, formerly Superintendent of State Institution for Feeble-Minded at Grafton, N. D., appointed Superintendent of Colorado State Insane Asylum at Pueblo.
- LANDER, DR., appointed Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa.
- LEAHY, DR. SYLVESTER R., Senior Assistant Physician at King's Park State Hospital at King's Park, N. Y., transferred to Manhattan State Hospital at Ward's Island, New York, January 1, 1913.
- LEONARD, DR. JOHN WESLEY, formerly Assistant Physician at Dixmont State Hospital at Dixmont, Pa., died February 24, 1913, aged about 55.
- LEVIN, DR. HYMAN L., Junior Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., promoted to be Assistant Physician April 1, 1913.
- LIKE, DR. OTIS, appointed Assistant Physician at Kankakee State Hospital at Kankakee, Ill.
- LIVINGSTON, DR. HENRY F., formerly Superintendent of South Dakota Hospital for the Insane at Yankton, died February 27, 1913, from heart disease, aged 69.

- LORD, DR. FRANK R., appointed Assistant Physician at Southern Indiana Hospital for the Insane at Evansville.
- LUCAS, DR. W. P., appointed Chief of Out Patient Staff of Psychopathic Hospital at Boston, Mass., October 1, 1912.
- MCCAFFERTY, DR. GEORGE W., Assistant Physician at Pennsylvania Hospital for the Insane at Philadelphia, appointed First Assistant Physician at State Hospital for the Criminal Insane at Fairview, Pa.
- MCDONOUGH, DR. VINCENT A., Assistant Physician at Kalamazoo State Hospital at Kalamazoo, Mich., resigned February 13, 1913.
- MCEWAN, DR. SAMUEL W., Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned September 22, 1912.
- MCKINNISS, DR. C. R., First Assistant Physician at Department for Men at State Hospital for the Insane at Norristown, Pa., promoted to be Chief Physician October, 1912.
- MCNERNEY, DR. WILLIAM J., appointed Medical Interne at Manhattan State Hospital at Ward's Island, New York, April 6, 1913.
- MAISCH, DR. CHARLES O., appointed Assistant Physician at Psychopathic Hospital at Boston, Mass., March 11, 1913.
- MALONEY, DR. THOMAS W., Medical Interne at Craig Colony at Sonyea, N. Y., resigned September 15, 1912, to enter private practice at Geneva, N. Y.
- MAUL, DR., Pathologist at Nebraska State Hospital at Ingleside, resigned to accept a position at the University of Denver.
- MAY, DR. HERMAN F., Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y., transferred to Buffalo State Hospital at Buffalo, N. Y.
- MILLER, DR. H. T., appointed Assistant Physician at Western State Hospital at Staunton, Va.
- MILLER, DR. SIDNEY, Instructor in Clinical Medicine at Johns Hopkins Medical School, appointed Chief of Clinical Laboratory at Phipps Psychiatric Clinic at Baltimore, Md.
- MILLIGAN, DR. JAMES A., Deputy Warden of State Prison at Michigan City, Ind., appointed Physician to Indiana Hospital for Insane Criminals in connection with the prison.
- MILLS, DR. WILLIAM PORTER, appointed Superintendent of New Mexico Hospital for the Insane at Las Vegas.
- MITCHELL, DR. THOMAS JEFFERSON, formerly Superintendent of Mississippi State Hospital at Jackson, died September 15, 1912, from senile debility, aged 82.
- MONTGOMERY, DR. HORACE C., Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., resigned December 13, 1912, to enter private practice at Henderson Harbor, N. Y.
- MOORE, DR. ROY S., Medical Interne at Buffalo State Hospital at Buffalo, N. Y., resigned to enter private practice in Cicero, N. Y.
- MORTON, DR. HARRY T., appointed Assistant Physician at Warren State Hospital at Warren, Pa.
- MURPHY, DR. DENNIS J., Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to Junior Assistant Physician February 1, 1913.
- MURPHY, DR. JOHN P. H., Junior Assistant Physician at Taunton State Hospital at Taunton, Mass., appointed Assistant Physician at Boston State Hospital at Boston, Mass., August 1, 1912, and resigned January 1, 1913.
- MYERSON, DR. ABRAHAM, appointed Assistant Physician at Psychopathic Hospital at Boston, Mass., October 1, 1912.
- NEWCOMB, DR. P. B., appointed Assistant Physician at Warren State Hospital at Warren, Pa.
- OBERNDORFF, DR. CLARENCE B., Medical Interne at Manhattan State Hospital at Ward's Island, New York, resigned March 1, 1913.
- OSBORNE, DR. A. E., Superintendent of Napa State Hospital at Napa, Cal., resigned.
- PALMER, DR. H. L., Superintendent of Utica State Hospital at Utica, N. Y., is taking a trip abroad.

- PAYNE, DR. GEORGE C., Medical Interne at Hudson River State Hospital at Poughkeepsie, N. Y., resigned December 31, 1912, to get general hospital experience.
- PEARCE, DR. LOUISE, Interne at Johns Hopkins Hospital at Baltimore, Md., appointed Interne at Phipps Psychiatric Clinic at Baltimore, Md.
- PEASE, DR. EDMUND M., appointed Assistant Physician at Kalamazoo State Hospital at Kalamazoo, Mich., December 29, 1912.
- PEDDICORD, DR. F. L., appointed First Assistant Physician at Central Kentucky Asylum for the Insane at Lakeland.
- PHELPS, DR. R. M., appointed Superintendent of St. Peter State Hospital at St. Peter, Minn., October 8, 1912.
- POLLOCK, DR. J. K., formerly Assistant Superintendent at Southeastern Hospital for the Insane at Madison, Ind., appointed Assistant Physician at Peoria State Hospital at Peoria, Ill.
- POSEY, DR. OLANDO, appointed Medical Interne at the Government Hospital for the Insane at Washington, D. C., December 2, 1912.
- POWERS, DR. HERBERT W., Assistant Physician at Kenilworth Sanitarium at Kenilworth, Ill., appointed Assistant Physician at The Milwaukee Sanitarium at Wauwatosa, Wis., March 1, 1913.
- PRATT, DR. E. C., appointed Assistant Physician at Kankakee State Hospital at Kankakee, Ill.
- RAWLINGS, DR. EVA, appointed Pathologist at Kalamazoo State Hospital at Kalamazoo, Mich., December 3, 1912.
- REA, DR. ROBERT H., appointed Acting Superintendent of Chicago State Hospital at Dunning, Ill.
- REED, DR. HARRY, appointed Second Assistant Physician at Massillon State Hospital at Massillon, Ohio, March 1, 1913.
- REID, DR. EVA C., Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned January 31, 1912.
- RENDER, DR. W. E., Second Assistant Physician at Western Kentucky Hospital for the Insane at Hopkinsville, transferred to Eastern Kentucky Hospital for the Insane at Lexington.
- RICHARDS, DR. CYRIL G., Assistant Physician at Bridgewater State Hospital at Bridgewater, Mass., appointed Assistant Physician at Boston State Hospital at Boston, Mass., May 1, 1912.
- RICHARDS, DR. R. L., U. S. Army, appointed Superintendent of Mendocino State Hospital at Talmage, Cal.
- RICHARDSON, DR. W. W., Chief Physician at Department for Men at State Hospital for the Insane at Norristown, Pa., resigned October, 1912, to open a private hospital near Pittsburgh.
- ROBINSON, DR. ROY F., appointed Second Assistant Physician at Western Kentucky Asylum for the Insane at Hopkinsville.
- ROWE, DR. MELVIN J., Assistant Physician at Kalamazoo State Hospital at Kalamazoo, Mich., resigned November 10, 1912.
- RUNYON, DR. WILLIAM D., appointed Assistant Superintendent of Iowa State Sanitarium at Oakdale.
- RUPP, DR. ROGER RALPH, appointed Interne at Psychopathic Hospital at Boston, Mass., January 3, 1913, to serve to July 1, 1913.
- RUSSELL, DR. JOHN W., Superintendent of Matteawan State Hospital at Fishkill-on-Hudson, N. Y., resigned February 27, 1913.
- RYERSON, DR. ESTHER, appointed Assistant Physician at Southern Indiana Hospital for the Insane at Evansville.
- SANDY, DR. WILLIAM C., JR., Assistant Physician at New Jersey State Hospital at Trenton, resigned.
- SCHROCK, DR. ROBERT D., Medical Interne at Binghamton State Hospital at Binghamton, N. Y., resigned January 1, 1913, and appointed Interne in the New York Hospital.
- SEWARD, DR. WILLIAM H., Medical Interne at Hudson River State Hospital at Poughkeepsie, N. Y., resigned December 31, 1912, to get general hospital experience.

- SHAW, DR. ARTHUR L., formerly Junior Assistant Physician at Craig Colony at Sonoma, N. Y., reinstated November 1, 1912, to work with the Resident Pathologist.
- SHELLENBERGER, DR. EDWARD B., Assistant Physician at State Hospital for the Insane at Warren, Pa., resigned to enter private practice in Philadelphia.
- SHERMAN, DR. MORRIS M., appointed Medical Intern at Manhattan State Hospital at Ward's Island, New York, November 1, 1912.
- SIMCOE, DR. C. B., appointed Assistant Physician at State Hospital No. 3 at Nevada, Mo.
- SMITH, DR. H. M., Superintendent of New Mexico Hospital for the Insane at Las Vegas, resigned.
- SMYTHE, DR. M. H., appointed Assistant Physician at Stockton State Hospital at Stockton, Cal.
- SOUTHARD, DR. ELMER E., appointed Director of Psychopathic Hospital at Boston, Mass., May 1, 1912.
- SPENCER, DR. ELIZABETH C., Chief Physician at Department for Women at State Hospital for the Insane at Norristown, Pa., resigned March 1, 1913.
- STEARNS, DR. A. WARREN, appointed Assistant Physician at Psychopathic Hospital at Boston, Mass., June 1, 1912, and promoted to be First Assistant Physician January 1, 1913.
- STECKEL, DR. H. A., Third Assistant Physician at Mt. Pleasant State Hospital at Mt. Pleasant, Iowa, appointed Assistant Physician at Kings Park State Hospital at Kings Park, N. Y.
- STEGE, DR. EDWARD M., appointed Assistant Physician at Kalamazoo State Hospital at Kalamazoo, Mich., March 3, 1913.
- STOERZER, DR. CHARLES H., appointed Special Medical Attendant at Manhattan State Hospital at Ward's Island, New York, November 1, 1912.
- SUMMERS, DR. W. B., appointed Assistant Physician at State Hospital No. 3 at Nevada, Mo.
- SWIFT, DR. W. B., appointed in charge of Voice Clinic at Psychopathic Hospital at Boston, Mass., October 1, 1912.
- TATJE, DR. ORAL E., First Assistant Physician at Massillon State Hospital at Massillon, Ohio, resigned to enter private practice March 1, 1913.
- TAYLOR, DR. MELVIN J., appointed Medical Intern at Hudson River State Hospital at Poughkeepsie, N. Y., January 2, 1913.
- THOMPSON, DR. CHARLES W., Assistant Physician at Upper Peninsula Hospital for the Insane at Newberry, Mich., appointed Assistant Physician at Woodcroft Sanitarium at Pueblo, Col.
- THORNE, DR. JOHN H., Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned September 26, 1912.
- TIBBETTS, DR. GUY D., appointed Intern at Psychopathic Hospital at Boston, Mass., July 1, 1912, and reappointed Junior Assistant Physician at Boston State Hospital at Boston, Mass., January 1, 1913.
- TODD, DR. S. WALLACE, appointed Medical Intern at Hudson River State Hospital at Poughkeepsie, N. Y., January 2, 1913.
- TOMLINSON, DR. H. A., Superintendent of Minnesota State Inebriate Hospital was given a complimentary banquet by the citizens of St. Peter, October 7, 1912.
- TONER, DR. JOHN EDMUND, formerly Assistant Physician at Government Hospital for the Insane at Washington, D. C., died October 30, 1912, aged 52.
- TORNEY, DR. GEORGE H., First Assistant Physician at Utica State Hospital at Utica, N. Y., resigned January 15, 1913, to become Assistant to Dr. H. R. Stedman at Bournewood.
- TRUITT, DR. RALPH P., Physician-in-Chief at City Detention Hospital at Baltimore, Md., appointed Assistant Physician at Phipps Psychiatric Clinic at Baltimore, Md.
- TUTT, DR. W. R., appointed Assistant Physician at Elgin State Hospital at Elgin, Ill.
- Vosburgh, Dr. Stephen E., First Assistant Physician at Boston State Hospital at Boston, Mass., and later Executive Assistant at Psychopathic Hospital, appointed First Assistant Physician at Maine Insane Hospital at Augusta, Me., December 1, 1912.

- WATERS, DR. P. S., appointed Assistant Physician at Anna State Hospital at Anna, Ill.
- WATSON, DR. WILLIAM HENRY, one of the Founders of Middletown State Homeopathic Hospital at Middletown, N. Y., died January 1, 1913, from nephritis, aged 83.
- WEEKS, DR. P. H., appointed Assistant Physician at Central Indiana Hospital for the Insane at Indianapolis.
- WILBOR, DR. LEON M., Medical Interne at Rochester State Hospital at Rochester, N. Y., resigned October 1, 1912.
- WILGUS, DR. SIDNEY, Superintendent of Kankakee State Hospital at Kankakee, Ill., resigned, and will conduct the Ransom Sanitarium at Rockford, Ill.
- WILLEY, DR. GORDON F., appointed Assistant Physician at Kalamazoo State Hospital at Kalamazoo, Mich., December 17, 1912.
- WITTMAN, DR. A. G., appointed Assistant Physician at Elgin State Hospital at Elgin, Ill.
- WOOLSEY, DR. C. L., appointed Assistant Physician at State Hospital No. 2 at St. Joseph, Mo.
- YERKES, PROFESSOR R. O., appointed Psychologist to Out Patient Department of Psychopathic Hospital at Boston, Mass., March 13, 1913.